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# The American Economic Review

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## A COMPARISON OF SOVIET AND AMERICAN INVENTORY-OUTPUT RATIOS

*By* ROBERT W. CAMPBELL\*

Soviet economists assert that their economic system is more economical of working capital than is the capitalist system. The argument runs that having eliminated the anarchy of competition, the difficulty of selling, and the large inventories arising from overproduction, they can keep inventories to the minimum required to maintain steady production and sale of goods. *Prima facie*, these reasons seem at least plausible. On the other hand a number of American studies of the working of the Soviet economic system have suggested that there are good reasons why the Soviet economy might require larger stocks of inventories per unit of output than does the American economy. Among other things, the chaotic functioning of the supply system, the slowness of transportation, and the pressures on managers to hoard materials would all lead to higher inventory-output ratios than in the United States.

It is the purpose of the present study to present some measures of inventory holdings and of output in the Soviet Union, to be compared with similar data for the United States, in order to determine which economic system is really the more economical of inventories. One possible approach would be to compare the total stock of inventories in the entire economy with some measure of total output, such as gross national product, for the two economies. There are, however, two deficiencies in such an approach: first, it is extremely difficult to obtain an economy-wide estimate of the stock of inventories in either economy; and secondly, such a comparison would be more or less irrelevant because of structural differences in the two economies. The nature of production is such that inventory-output ratios are different for the various activities and processes which generate the national income, so

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that economy-wide inventory-output ratios are influenced by the composition of output as well as by inventory efficiency in individual sectors of the economy.

The approach to be followed here, therefore, will be to make comparisons of Soviet and American inventory-output ratios for two individual sectors, namely, industry and trade. This approach does not completely eliminate the problem of differences in the composition of output, but it does narrow it down considerably. Moreover, these are the two sectors in which the bulk of inventories are concentrated. On January 1, 1956, for instance, something like 86 per cent of all inventories in the USSR were accounted for by these two sectors.<sup>1</sup> Fortunately, also, both in the United States and in the Soviet Union, the available data on inventories is much better for these two sectors than for the rest of the national economy.

### I. Industry

Differences in Soviet and American statistical practice make it impossible to delineate "industry" sectors in the two economies that are exactly comparable in scope. It is necessary to take the Soviet concept of industry as given, and then try to approximate it as closely as possible in American statistical data. The closest analogue in American statistics to industry as it is defined in the Soviet Union is manufacturing industry as defined in the Standard Industrial Classification. The Soviet concept is rather broader in scope, including in addition to the manufacturing branches also power generation, mining and fisheries. There is no practicable way to modify the statistics on output or inventories to have comparable figures for the two economies, so we have to take the figures as given, and then subsequently estimate the possible effect of differences in scope on the inventory-output ratios found.

*Data for the United States.* Figures on inventories in manufacturing are compiled by the Department of Commerce, and are available for the years from 1929 to the present. These figures are simply taken as given. It is more difficult to decide on a measure of manufacturing output. The main choice is between some measure of net output, such as income generated or value added, or some measure of gross output, such as, for instance, the data on sales and shipments of manufacturers. We

<sup>1</sup> According to *Vestnik Statistiki*, 1957(2), p. 94, 38.8 per cent of working capital in the Soviet economy on Jan. 1, 1956 was provided by bank credit, and the corresponding figures for industry and trade were 34.2 per cent and 46.9 per cent respectively. According to *Den'gi i Kredit*, 1957(2), p. 3, total bank credit on Jan. 1, 1956 was 200 BR [billion rubles], and according to A. Popov, *Roľ gosudarstvennogo banka v narodnom khoziaistve*, Moscow 1956, p. 23, 50.1 per cent of this, or 100.2 BR, was extended to industry, 35.2 per cent or 70.4 BR to trade. These figures together imply total working capital in the economy of 515.5 BR, of which 442.2 BR or 86 per cent was in industry and trade.

are almost forced to use a gross concept of output in order to achieve comparability with the available Soviet data, and in order to have a fairly continuous series it is convenient to use the figures on manufacturers' sales compiled by the Department of Commerce. This choice ensures comparability in scope for the inventory figures and the output figures, and also provides a continuous series from 1929. These figures for inventories and for sales are presented in the first two columns of Table 1; and in the last column, the ratio of sales to inventories.<sup>2</sup>

*Data for the Soviet Union.* The next step is to obtain for the Soviet concept of industry figures which are as close as possible to the U. S. concepts of output and inventories reflected in Table 1. The Soviet

TABLE 1.—SALES, INVENTORIES, AND SALES-INVENTORY RATIOS IN MANUFACTURING, UNITED STATES, SELECTED YEARS

Year	Annual Sales (billion dollars)	End of Year Inventories (billion dollars)	Ratio of Sales to Inventories
1929	70.3	12.8	5.49
1930	57.1	11.3	5.05
1933	34.3	8.2	4.18
1935	50.3	9.1	5.51
1940	70.3	12.9	5.46
1944	165.4	19.6	8.45
1945	154.5	18.5	8.37
1950	231.4	34.5	6.70
1954	280.7	43.5	6.45

Source: U. S. Department of Commerce, Office of Business Economics, *Business Statistics, 1957 Edition*, Washington 1957, pp. 14 and 17.

planners use a number of concepts of industrial output of which the one closest to the output concept chosen for the United States is gross output (*valovaia produktsiia*) in current prices. Except for a few qualifications this is essentially a figure obtained by adding together the value of output of all industrial enterprises, value of output being measured in current prices net of turnover taxes.

Although the Soviet statisticians compute gross output of industry in current prices for every year, unfortunately they never publish the figures. But estimates can be made in various indirect ways. For many of the years in which we are interested the Russians have published a percentage breakdown of outlays on production by large-scale enter-

<sup>2</sup> Throughout the present article, the ratios computed are between output for the year and inventories as of the end of the year. It would be more accurate to use an annual average inventory figure, rather than the year-end figure, but the procedure used generally gives results which are not far different, and permits the calculation of more ratios than would otherwise be possible.

prises by such categories as materials, wages, amortization, and so on. In addition there are available for many of these years data on the absolute amount of amortization charged or for the wage bill in large-scale industry, and these data together with the cost structure imply figures for the cost of industrial output. Estimates of the cost of output of large-scale industry obtained by this method are shown in columns (1) and (2) of Table 2.

For most of the years shown the estimate based on the amortization charged is larger than that based on the wage bill, probably because

TABLE 2.—GROSS OUTPUT, INVENTORIES, AND OUTPUT-INVENTORY RATIOS IN THE SOVIET UNION, SELECTED YEARS

Year	(1) Cost of Output via Wage Bill (million rubles)	(2) Cost of Output via Amortization (million rubles)	(3) Value of Output (billion rubles)	(4) End of Year Inventories (billion rubles)	(5) Ratio of Output to Inventories
1928	8,983		16.7		
1929			21.0	5.2	4.0
1930	12,941		27.7	6.1	4.5
1931	22,015		33.9	8.9	3.8
1932	31,827	31,431	38.5	12.0	3.2
1933	38,055	41,000	41.9		
1934	47,498	49,628	53.	25.1	2.1
1935	71,704	81,961	86.	30.4	2.8
1936	100,145	112,347	120.	39.3	3.1
1937	151,935	148,900	159.	49.8	3.2
1938		189,000	190.	56.7	3.4
1939			220.	75.0	2.9
1950			520.	188.	2.8
1955			830.	227.	3.7

Sources: The data for this table are taken mostly from the standard Soviet statistical handbooks, such as *Sotsialisticheskoe stroitel'stvo*. Detailed explanations of the derivations are given in a mimeographed appendix, obtainable from the author.

the stated wage bill understates actual expenditures for labor. Other indications of the cost of industrial output can be obtained from official statements about the magnitude in rubles of a one per cent reduction in the cost of industrial output, and these estimates can then be used as a check on the other procedures. With the addition of profits and subtraction of subsidies, these figures can then be converted into the value of output of large-scale industry in current prices. Additional indications of the size of output are provided by the official series on the value of output of large-scale industry in 1926-27 prices. For some of the years not too far removed from 1926-27, this measure is probably fairly close to the value of output in current prices. These various approaches frequently give contradictory results, but in column (3) of Table 2 there

is shown a series of figures for output which is intended to be a fairly high estimate of industrial output, chosen from among these alternative sources of information.

The intention has been to provide a measure of output of large-scale industry rather than of all industry, for it is likely that the data for inventories cover large-scale industry only. Even if this supposition were wrong, the results would not be greatly affected. In the later 'twenties and early 'thirties large-scale industry accounted for about 90 per cent of all industrial output,<sup>3</sup> so that substitution of all industrial output for large-scale industrial output would raise the ratios in column (5) of Table 2 for those years by about 11 per cent, i.e., from something in the neighborhood of 4 to about 4.4. In the second half of the 'thirties the relative importance of small-scale industry probably declined rapidly, so that a much smaller correction would have to be made for these and for subsequent years.

Estimates of inventories in Soviet industry are shown in column (4) of Table 2. Very little direct information has been published by Soviet agencies on the size of inventories in industry, and so these estimates have necessarily been based on rather roundabout calculations.<sup>4</sup>

The closest Soviet analogue to the American concept of inventories is "circulating capital" (*oborotnye sredstva*).<sup>5</sup> This differs from inventories in the usual sense, however, in including in addition to real inventories also such items as claims against other enterprises and monetary assets. The Soviet enterprise is able to hold circulating capital on the basis of three main kinds of liability items, namely bank credit, indebtedness to other enterprises, and "own working capital" (*sobstvennyye oborotnye sredstva*). This last item is defined in Soviet accounting practice as the difference between the sum of a number of liability accounts and the value of various kinds of "immobilized" assets, this difference being a measure of its resources free to be invested in various kinds of circulating capital. There is enough information to build up a fairly accurate series on the own working capital of industry.

For the economy taken as a whole, of course, the indebtedness resource is offset by the claims of other enterprises and so cannot be a means for holding real inventories. This is probably approximately true

<sup>3</sup> TsUNKhU, *Sotsialisticheskoe stroitel'stvo*, 1934, p. 24.

<sup>4</sup> The derivation of individual figures is too complicated to be explained here; a mimeographed appendix giving the details of these calculations can be obtained from the author. There is, however, a great deal of data bearing on the size of inventories, with a number of alternative possibilities of cross-checking the results, so that we can be fairly confident that these figures approximate closely the magnitudes we are interested in.

<sup>5</sup> An account of Soviet working capital concepts can be found in any Soviet textbook on industrial accounting. A particularly careful explanation is given in S. Shchenkov, *Bukhgalterskii uchet v promyshlennosti*, Moscow 1955, pp. 371-85.

even for a single sector of the economy, such as industry. So if bank credit and own working capital for industry are added together, the result is a close approximation of real inventories plus monetary assets. The monetary assets of a Soviet enterprise are held almost exclusively in the form of an account with the *Gosbank*, and so by using *net* indebtedness of industry to the *Gosbank* rather than gross indebtedness it is possible to obtain from the liability side of the balance sheet a measure of real inventories. This is the approach which underlies most of the estimates of inventories shown in Table 2.

Comparing the results obtained for the United States and for the Soviet Union, it appears that the Soviet Union requires larger stocks of inventories per unit of output than does the U. S. economy. In the United States the ratio reached its low point of a little over 4 in the depression years of the early 'thirties, but for most other years it has been much higher. During the second world war when the U. S. economy was reorganized to resemble in some ways the Soviet economy the ratio rose above 8. In the Soviet series, on the other hand, a ratio of about 4 represents the high point, and for most of the years observed the ratio was around 3. There has been a notable improvement between 1950 and 1955. In 1949 an intensive campaign to cut down on inventory requirements was begun. Wasteful inventory management became a standard rebuke in the budget speech, there was a "spontaneous" spate of pledges to get more output per ruble of inventories, and there was a long discussion in the economic journals aimed at finding an effective indicator of inventory efficiency to control enterprise performance. Apparently this focusing of attention on the problem resulted in an improvement in the ratio.

The relatively low ratio for the Soviet Union compared with the United States is an interesting finding. There are certainly many reasons for expecting that the Soviet economic system should be wasteful of inventories, but the difference found is surprisingly large. Is it possible that the results arise from the methods and concepts used, and may not really reflect inventory inefficiency? There are several possible questions.

1. Are there differences in the valuation of inventories in the two economies? Generally speaking Soviet inventories are priced at current prices; when prices are changed, inventories are revalued immediately at the new prices. Most inventories in U. S. manufacturing are valued on the principle of "cost or market value, whichever is lower." This practice results in undervalued inventories when prices are rising, but in periods of falling or steady prices is no different from the Soviet principle. About 15 per cent of inventories in U. S. manufacturing are valued on the LIFO basis,<sup>6</sup> which also results in undervaluation when

<sup>6</sup> *Business Statistics, 1957 Edition*, p. 204.

prices are rising, and overvaluation when prices are falling. These peculiarities of the American valuation methods may be part of the explanation for the relatively high figures in the postwar period in the United States, but it would probably not influence the ratios for the 'thirties at all.

2. What is the effect of the difference in scope of the "industry" concept in the two economies? It will be remembered that the Soviet concept of industry includes mining and power generation in addition to the branches covered in the American figures. In both these branches the ratio of output to inventories is higher than in manufacturing,<sup>7</sup> so that the figures in Table 2 are higher than figures for Soviet manufacturing alone would be.

3. It is possible that some of the difference between the U. S. and Soviet ratio may be explained by differences in the branch structure of industry. Inventory-output ratios vary as between individual branches of industry, and so differences in branch composition would result in different averages, even if U. S. and Soviet ratios were identical in each branch separately. Further study of this question is needed, but is beyond the scope of this article.

4. There may be systematic biases in the reporting of inventories in each economy. In the Soviet Union increments in goods in process are counted as output in some industries, and so there may be some pressure on plant managers to exaggerate inventories in these branches. In the United States there may be an incentive to underestimate inventories in order to reduce profits and so tax liability. Verification of these possibilities would be a formidable problem, but it does not seem likely that any such biases could be quantitatively important.

5. Because we have used a gross concept of output, the ratio of output to inventories will be sensitive to differences in the degree of integration or fragmentation in the industrial structure. Can it be that the higher ratio of output to inventories in the United States is the result of more double-counting in the U. S. measure of output? This is a very elusive question, but a rough answer can be gotten by comparing the ratio of output gross of materials, fuel and power to output net of these inputs in both economies. This method won't answer the question precisely. Some materials inputs are from enterprises outside the industrial sector, and so the ratio of net to gross will be affected not only by the degree of integration in industry, but also by the composition of output (e.g., as between industry processing agricultural raw materials and other industry) and by relative prices of materials. But the result still should be suggestive.

For the United States the ratio of value added (i.e., value of output less materials, purchased energy and fuel) to gross output in manu-

<sup>7</sup> See for instance data cited in *Planovoe Khoziaistvo*, 1940 (5), p. 53.

facturing has stayed very close to 40 per cent during the whole period from 1929 to the present.<sup>8</sup> The Central Statistical Administration has published the statement on the cost structure of Soviet industrial output in 1955 shown in column (1) of Table 3.

On the basis of the information that in 1955 profits in industry were 8.2 per cent of costs, the distribution given in column (1) has been corrected to one for value of output as given in column (2). On the basis of the latter figures the ratio of value added to gross output in Soviet industry turns out to be about 33 per cent.<sup>9</sup> (The same result is obtained if this calculation is made for 1937.) So despite the qualifica-

TABLE 3.—STRUCTURE OF COST OF INDUSTRIAL OUTPUT AND OF VALUE OF OUTPUT OF SOVIET INDUSTRY, 1955

	(1) Per Cent of Cost of Output	(2) Per Cent of Value of Output
Materials	66.1	61.1
Fuel	4.4	4.1
Energy	1.8	1.7
Amortization	3.4	3.1
Wages	21.2	19.6
Other	3.1	2.9
Profits	—	7.6
Total	100.0	100.0

Sources: The cost structure is taken from TsSU, *Promyshlennost' SSSR*, p. 29. The statement for the rate of profits is given in A. Zverev, "Gosudarstvennyi biudzhnet vtorogo goda shestoi piatiletki," *Planovoe Khoziaistvo*, 1957 (3), p. 18.

tions indicated above about our method of calculating net output it certainly does not seem likely that the difference in the ratio of output to inventories in the two economies could be accounted for by a differential degree of grossness in the output measure. Indeed, such evidence as is available suggests that allowance for this factor implies even greater inefficiency in inventory use than was shown in the original calculations.

## II. Trade

The term "trade" is in common usage a fairly nebulous term, and so it is necessary first to define this activity and to explain the concepts

<sup>8</sup> Data on value added in manufacturing can be found in U. S. Bureau of the Census, *Statistical Abstract of the United States: 1957*, Washington 1957, p. 783, and data on sales by manufacturers are found in *Business Statistics, 1957 Edition*, p. 14.

<sup>9</sup> It is not at all surprising to find that in the Soviet Union the ratio of gross to net output is greater than in the United States. There is great pressure in the Soviet economic system to induce administrators to resist integration of enterprises. The most important measure of performance for Soviet industry is gross value of output, and so there is a bias on the part of ministries and intermediate level organs to do as much double-counting as possible.

of stock and flow associated with it. The concept of trade which we have in mind is simple enough—it is the process of moving finished consumer goods from the producing enterprises to households. There is little difficulty in measuring the flow of this activity in any economy. It is given by retail trade turnover or retail sales, i.e., the flow of goods through the last stage of the process. The main problem is to decide just how broad to make the concept of retail sales. The Soviet and U. S. statistics seem to be roughly comparable in scope; in particular they both limit retail sales to sales of goods and omit sales of services. We have also excluded, for the purpose of the present study, sales of eating and drinking places, on the grounds that this is an activity in which the problem of inventory economy is not a matter of great importance.<sup>10</sup>

Ideally the concept of stocks involved in trade should be the total stock of finished goods held at any given moment by all organizations—retailers, wholesalers, and manufacturers—at all stages of trade activity. Unfortunately, however, it is difficult to clothe this ideal concept in statistical fact. The worst problem is in the U. S. statistics; they are simply not reconcilable with this concept. Much of the stock we are interested in measuring is held by wholesalers, but wholesale trade as defined in the Standard Industrial Classification includes not only the movement of goods from producers to households, but also the movement of goods from producer to producer. Data on U. S. wholesale trade generally conform to this definition. Another difficulty is in measuring the stocks of finished goods held by manufacturers up to the time they are moved on to some other organization on their way to households. This is a fairly important part of the total stock associated with trade, particularly in the United States, where retail trade organizations get their supplies to a significant extent directly from manufacturers without the intervention of wholesalers.<sup>11</sup> The amount of finished goods held by manufacturers for ultimate sale to households can be estimated only roughly, and then only for isolated years. Soviet statistical rubrics are more nearly congruent with our ideal concept. The Soviet definition

<sup>10</sup> Unfortunately it is not possible also to exclude the stocks associated with this portion of trade, but it is assumed that they would be small. Moreover, since the ratio of sales of eating and drinking places to total retail sales is not widely different in the two countries, there should be no differential distortion because of this omission. The share of sales of eating and drinking places in all retail sales has been about 10 to 20 per cent in the Soviet Union and about 10 per cent in the United States. See TsSU, *Sovetskaiia torgovlia, statisticheskii sbornik*, Moscow 1956, p. 20, and *Statistical Abstract of the United States: 1957*, p. 844.

<sup>11</sup> Sales by wholesalers to retailers amounted to only 59 per cent of retail sales in 1935, 53 per cent in 1939, and 50 per cent in 1948. U. S. Bureau of the Census, *U. S. Census of Business: 1948*, Vol. IV: *Wholesale Trade—General Statistics*, Washington 1952. Similar information for 1954 has not yet been released. A large part of the difference lies in the retail trade mark-up, of course, but even allowing for this, there still remains a considerable gap to be covered by direct purchases from manufacturers.

of wholesale trade involves only the movement of goods to retailers, and Soviet data on stocks in wholesale trade also include most inventories of finished goods held by manufacturers to be passed on to retail trade.<sup>12</sup> So it is necessary only to add the Soviet figures for stocks in wholesale trade to stocks in retail trade to obtain the desired total.

TABLE 4.—INVENTORIES, SALES AND SALES-INVENTORY RATIOS IN RETAIL TRADE IN THE UNITED STATES AND U.S.S.R., 1932-1935

Year	United States (billion dollars)		Sales-Inven- tory Ratio	U.S.S.R. (billion rubles)		Sales-Inven- tory Ratio
	Inventories	Sales		Inventories	Sales	
1932				2.4	35.5	14.8
1935				8.8	74.5	8.5
1936				11.7	98.8	8.4
1937				13.6	115.8	8.5
1938	6.6	34.9	5.3	12.9	127.4	9.9
1939	6.9	38.5	5.6	12.9	149.3	11.6
1940	7.6	42.6	5.6	16.4	152.2	9.3
1941	9.8	50.7	5.2	7.3	131.4	18.0
1942	10.0	51.5	5.1	5.7	59.6	10.5
1943	9.5	56.0	5.9	10.0	63.3	6.3
1944	9.5	61.9	6.5	13.7	90.8	6.6
1945	9.9	69.7	7.0	19.1	127.0	6.6
1946	14.8	91.9	6.2	27.8	198.4	7.1
1947	17.6	108.9	6.2	38.7	262.7	6.8
1948	19.8	119.8	6.1	59.5	264.7	4.4
1949	19.1	120.2	6.3	72.3	289.6	4.1
1950	24.1	133.1	5.5	64.1	312.2	4.9
1951	26.5	146.0	5.5	76.9	329.6	4.3
1952	27.0	151.4	5.6	93.2	340.2	3.6
1953	28.4	157.4	5.5	94.3	373.6	4.0
1954	27.6	157.5	5.7	90.0	421.9	4.7
1955				98.9	443.1	4.5

Sources: The U. S. data are based on *Business Statistics, 1957 Edition*, and on U. S. Department of Commerce, Office of Business Economics, *National Income, 1954 Edition*, Washington 1954. Data for the Soviet Union are from *Sovetskaya torgovlia*. Detailed citations and explanations of adjustments made are to be found in the mimeographed appendix.

Unfortunately, however, such data on stocks in Soviet wholesale trade are available for only a limited number of years.

Because of these data limitations we shall for the moment consider the ratio of retail sales to stocks held by retail trade organizations alone. Data of this type are available for both economies for a fairly

<sup>12</sup> The definition of wholesale trade in TsUNKhU, *Slovar'-spravochnik po sotsial'no-ekonomicheskoi statistike*, Gosplanizdat, Moscow 1944, p. 164, is "turnover of an intermediate character concerned with the sale of consumption goods to trade organizations." For a statement that stocks held by manufacturers are included in the data on wholesale trade see N. N. Riauzov and N. P. Titel'baum *Statistika sovetskoi torgovli*, Moscow 1956, p. 91.

long series of years, and so this approach is very useful in investigating changes over time in both economies. Subsequently we will try to make some estimates of total stocks involved in trade for a few years to see what modifications might have to be made in our conclusions if we were able to use the ideal concepts. The data for inventories and sales in retail trade organizations in the United States and Soviet Union for a series of years are presented in Table 4. There are two important points we want to discuss with regard to these data: (1) changes over time in the Soviet Union and (2) the difference between the ratios for the United States and the Soviet Union.

*Changes over time in the Soviet Union.* The most striking thing about the series for the Soviet Union is the considerable decline in the sales-inventory ratio. From an average of perhaps 9 in the prewar years, it has dropped to something in the neighborhood of 4 in the postwar years. In other words it now takes roughly twice as big a stock of goods to support a given flow of retail sales as it did in the 'thirties. This is all the more surprising when we note that in the case of the United States there has been virtually no change over the entire period, and indeed even very little variation from year to year. What explanation can there be for this startling change?

In view of the magnitude of the change, it is hard to believe that it can be the outcome of changes in inventory efficiency and one is tempted to find some alternative explanation, such as some institutional change involving pricing or valuation practices. If, for instance, inventories in the prewar period had been valued net of the very high turnover taxes, and gross of these taxes in the postwar period, this could go a long way toward explaining the decline in the ratio. But there appears to be no evidence to suggest that any such change has taken place. There seems to be no doubt that the stocks are now valued at prices gross of turnover tax, but this apparently has always been the case. The tax has always been paid before the goods ever came into the hands of retail trade organizations, so that the inventories in trade were valued at prices gross of the turnover tax.<sup>13</sup> Furthermore, it is clear from the textbooks on accounting in trade that although the retail trade organizations value stocks both in terms of retail prices and at cost to themselves, no attempt is made to distinguish the value of these goods at prices net of turnover tax. Therefore it would not be possible for them even to report their stocks in prices net of turnover tax.<sup>14</sup>

Another factor which might have some effect on the sales-inventory

<sup>13</sup> "... the practice in the thirties was to have the tax on industrial commodities paid by the factory, and on agricultural commodities by the procurement organization." F. D. Holzman, *Soviet Taxation*, Cambridge, Mass. 1955, p. 90.

<sup>14</sup> See for instance, N. I. Il'in, *Bukhgalterskii uchet v sovetskoi torgovle*, Moscow 1954, Ch. 5.

ratio would be changes in the structure of trade. There are marked differences in the ratios for different kinds of trade, so that a shift in the composition of trade might lead to a change in the average ratio for trade as a whole. For instance if we distinguish only trade in food products and trade in other products, it turns out that the sales-inventory ratio for the latter is of the order of three times the ratio for the former, both in the USSR and in the United States.<sup>15</sup> But as will be shown subsequently, there has been virtually no shift in the structure of trade as between these two categories, and the sales-inventory ratio has deteriorated more or less uniformly for both categories.

Some of the decline in the sales-inventory ratio in Soviet retail trade is accounted for by a change in organization which has resulted in a smaller fraction of total trade inventories being held by wholesalers, and a higher proportion by the retail trade network. In 1937 retail trade organizations held something like 60 per cent of all stocks and in 1940, about 56 per cent, as against something like 80 per cent in the postwar period.<sup>16</sup> If we reallocate the total postwar stocks between wholesale and retail trade in the postwar period to approximate the prewar distribution this would bring the sales-inventory ratio up to somewhere in the neighborhood of 5 instead of the actual 4. But this is still considerably below the prewar ratio, and so this factor does not go very far towards explaining the deterioration. There appears really to have been a significant change in the sales-inventory ratio for all kinds of trade and for trade activity as a whole.

We could interpret this in two possible ways. (1) There may have been an actual deterioration in the technical efficiency with which the goods are moved through the channels of trade, i.e., longer hauls, more "dead stock," excessive intermediate handling of goods, and less frequent shipments, for example. (2) A more plausible explanation would be that the change represents an improvement in the quality of Soviet trade. It seems quite possible that the very high ratios of the prewar period reflect inadequately filled pipelines, intermittently empty shelves, and consequently great inconvenience to the consumer rather than anything that could be called rational economy of inventories. The postwar figures would represent a situation in which there has been a less uneven flow of goods through the system, and more nearly constant availability of goods. If this is indeed the explanation, it is an interesting fact in itself, and an important point to keep in mind when the difference in the ratios for the United States and the Soviet Union is considered.

*Comparison of U. S. and Soviet ratios.* The comparative inventory

<sup>15</sup> *Sovetskaiia torgovlia*, pp. 88-91 and *Business Statistics, 1957 Edition*, pp. 45-50.

<sup>16</sup> *Sovetskaiia torgovlia*, p. 79.

intensity in Soviet and U. S. trade depends on the period we are considering. The U. S. ratio has remained more or less constant at about 5.5 over the period while the Soviet ratio has declined from 9 to 4. If the interpretation suggested above for the decline in the Soviet ratio is accepted, the implication is that the postwar Soviet figure represents a qualitative state of trade more nearly comparable to that in the United States as far as shortages, customer convenience, and so on is concerned. If this is the case, then it appears that the Soviet trade system is significantly less economical of inventories than is trade in the United States. There are, however, two additional considerations to be investigated, namely (1) difference in the organization of trade and (2) difference in the composition of trade in the two economies.

TABLE 5.—RATIO OF RETAIL SALES TO TOTAL STOCKS IN TRADE, SOVIET UNION, SELECTED YEARS

Year	Total Stocks in Trade (billion rubles)	Sales Inventory Ratio
1937	22.5	5.1
1940	29.3	5.2
1950	96.3	3.2
1951	111.7	3.0
1952	128.8	2.6
1953	123.9	3.0
1954	110.9	3.8
1955	124.6	3.6

Source: *Sovetskaya torgovlia*, pp. 79; and Table 4.

1. Our own economic history has been marked by radical changes over time in the institutional organization of the distribution process, with consequent shifts in the relative importance of the different links in the system as inventory holders. It is conceivable that such a difference between U. S. and Soviet institutions should be part of the explanation for the comparatively high inventory-sales ratio of Soviet retail enterprises, and our view of inventories should be broadened to take in all the stocks of finished goods held for eventual sale to consumers to see whether this changes the result of the comparison.

Data on the value of stocks in all links of the Soviet trade network are available for several years. These are presented in Table 5 with the associated sales-inventory ratio for each year. Although the statistical source is somewhat vague as to the meaning of these figures, it is evident from discussions of trade statistics in other Soviet sources that they do not include goods held for sale to industrial users,<sup>17</sup> they do

<sup>17</sup> The definition of wholesale trade in TsUNKhU, *Slovar'-spravochnik po sotsial'no-ekonomicheskoi statistike*, Moscow 1944, p. 164 is "turnover of an intermediate character concerned with the sale of consumption goods to trade organizations."

include goods held by all the organizations standing between the producer and the consumer, including even the finished goods held in warehouses of industrial producers.<sup>18</sup> Furthermore, it is fairly certain that they are valued in retail prices.<sup>19</sup>

Figures for total stocks of goods held for ultimate sale to consumers at all stages of the trade system in the United States are much more difficult to obtain. However, on the basis of data in the Census of Business and the Census of Manufactures for certain years, it is possible to make estimates of the concepts we want. As stated earlier, wholesale trade statistics in the United States include not only the handling of goods destined for consumers, but also goods destined for producers. So the first step is to separate out from wholesale trade inventories those stocks which are held for sale to consumers. The Census of Business for both 1939 and 1948 gives a breakdown of wholesale trade sales by kind of wholesaler and by class of customer. It also gives inventories held by each kind of wholesaler. Our procedure is to allocate wholesalers' inventories to "trade" as we have defined it in proportion to the percentage of the wholesalers' sales which went to retailers. The result is an estimate of the stocks held by wholesalers for sale to households rather than to producers. There is certainly no reason for supposing that this procedure will give exact results, but it is the best that can be done under the circumstances.

The next step involves making an estimate of the stocks of finished goods held by manufacturers for purposes of trade. The 1939 and 1947 Census of Manufactures gives end-of-year inventories of finished goods held by manufacturers, broken down by branch of industry. An estimate of inventories held for consumers is obtained by adding up the finished-goods inventories in those branches of industry whose output is destined mainly for consumers. Again any such allocation is bound to involve many errors, but still it will provide a rough approximation of the desired concept. (Unfortunately the 1947 Census of Manufactures inventories figures are for January 1, 1948, rather than for Janu-

<sup>18</sup> The main sales agencies of the branches of industry producing consumer goods are now part of the Ministry of Trade, but even when they were administratively under the control of the industrial commissariats, they were still included for statistical purposes in wholesale trade. *Slovar'-spravochnik*, p. 164. Moreover, according to N. N. Riazov and N. P. Titel'baum, *Statistika sovetskoi torgovli*, Moscow 1956, p. 91, warehouses attached to industrial plants also report their inventory holdings for inclusion in the totals of wholesale trade stocks.

<sup>19</sup> There is no explicit statement in the source to this effect, but on the basis of the following evidence, it seems fairly certain that the figures are in retail prices. In *Sovetskaiia torgovlia*, p. 79, there is a table which gives the value of stocks in wholesale trade at the end of 1955 as 25.7 BR, and also states that these stocks would support 20 days of retail trade turnover. Taking 5.47 per cent (i.e., 20 divided by 365) of the retail trade turnover for 1955, we get a figure of 27.5 BR. Though it is not clear just why there should be this small discrepancy, the figures are sufficiently close to each other to suggest that the wholesale trade stocks are valued at prices very close to retail prices.

ary 1, 1949, which is the date of the Census of Business figures for wholesale trade inventories.)

The next step is to convert these stocks into retail prices. As they stand they are valued at cost to the manufacturer or wholesaler. A rough estimate of the mark-up for wholesale trade is obtained by determining the ratio of income generated in wholesale trade to wholesale sales. This turns out to be about 15 per cent,<sup>20</sup> and this, together with the retail trade mark-up of 25 per cent estimated earlier gives an overall conversion factor of 1.44. In figuring this mark-up no allowance has been made for the difference between the cost of goods held by manu-

TABLE 6.—RATIO OF RETAIL SALES TO TOTAL STOCKS IN TRADE, UNITED STATES, 1939 AND 1948  
(billion dollars)

	1939	1948
Inventories held by manufacturers	1.5	3.8*
Inventories held by wholesalers	2.0	4.4
Total	3.5	8.2
Total at retail prices	5.0	11.7
Inventories held by retailers	6.9	19.8
Total	11.9	31.5
Retail sales	38.5	119.8
Sales-inventory ratio	3.2	3.1

\* First of year.

Sources: The data for inventories held by manufacturers are from the U. S. Bureau of the Census, *Census of Manufactures, 1939, Vol. I, Statistics by Subjects*, p. 354, and *Census of Manufactures, 1947, Vol. I, General Summary*, p. 15. The data for stocks held by wholesalers were computed from data in U. S. Bureau of Census, *U. S. Census of Business, 1948, Vol. IV: Wholesale Trade—General Statistics*, Washington 1952, p. 22, and *Statistical Abstract, 1957*, p. 856. The figures for inventories in retail trade and for retail sales are taken from Table 4. The details of the calculations are available from the author on request.

facturers, and the price at which they are sold. But this is probably a small omission. Much of the manufacturers' stock will be sold directly to retailers, and probably the wholesale trade mark-up will be an adequate expression of the difference in these cases. Only in the case where a manufacturer sells to a wholesaler will there be a difference not accounted for. Then, finally inventories in retail trade outlets are added (already marked up to retail prices in Table 4) and then the ratio of retail sales to inventories held at all stages of the distribution system can be calculated. These calculations are summarized in Table 6.

Comparing the results of Tables 5 and 6, the conclusion seems to be

<sup>20</sup> Estimates of income originating in wholesale trade are found in *National Income, 1954 Edition*, pp. 176-77. Sales of wholesale trade are given in *Business Statistics, 1957 Edition*, p. 13. For the years for which these series are both available, i.e., 1939 to the present, the ratio of income to sales has been fairly constant, varying between 13 and 16 per cent.

that there is a considerable organizational difference between Soviet and American trade, with a larger proportion of all inventories held by organizations other than retailers in the American than in the Soviet economy. When correction has been made for this difference, the result is sales-inventory ratios which are not far different for the two economies, at least in the postwar period.

2. The second qualification to be considered is the difference in the composition of trade in the two economies. One of the most notable contrasts between trade in the United States and in the Soviet Union is the relative importance of food versus nonfood trade. Trade in food products has characteristically accounted for half or more of total Soviet trade, whereas in the United States the share has been just slightly above one-fourth.<sup>21</sup> Since the sales-inventory ratio differs considerably between food trade and other trade, the figures of Table 4 therefore do not give a true picture of relative inventory efficiency in the two economies. The quantitative effect of this difference on the aggregate ratios is significant. Both in the United States and in the Soviet Union the sales-inventory ratio for food trade is approximately three times that for nonfood trade.<sup>22</sup> If we weight the U. S. sales-inventory ratios for food and nonfood trade in accordance with the relative importance of these two kinds of trade in the Soviet Union, the average ratio would be a little over 7. Thus it appears from this calculation that the Soviet economy takes roughly half again as much inventory to stock a given flow of goods to consumers as is the case in the United States.

No exact quantitative reconciliation of the effects of these two sorts of difference between Soviet and U. S. trade will be essayed here, but the net effect would be more or less as follows. Allowance for the differences in institutional structure eliminates the difference in the ratio indicated in Table 4, where stocks in retail units only were considered. But on the basis of the difference in the composition of trade it is finally concluded that the "structural" ratios underlying the average in the Soviet Union are significantly lower than in the United States.

### III. Conclusion

Despite the theoretical difficulties and the data problems involved in trying to compare Soviet and U. S. inventory-output ratios, it is highly

<sup>21</sup> See *Sovetskaiia torgovlia*, pp. 52-55, and *Statistical Abstract of the United States: 1957*, p. 844.

<sup>22</sup> For the Soviet Union the sales-inventory ratio for food trade was 2.4 times the sales-inventory ratio in nonfood trade in 1950, 2.8 times in 1954, and 3.5 times in 1955. *Sovetskaiia torgovlia*, pp. 48, 50, 88, and 90. In the United States these same ratios were 2.6 in 1951, 2.8 in 1953, and 2.9 in 1954. *Business Statistics, 1957 Edition*, pp. 45-49.

likely that the Soviet system requires higher stocks in relation to flows than does the U. S. economy. This conclusion contradicts Soviet statements on the subject, but with regard to industry, at least, is not at all inconsistent with what is known about the operation of the economy. In particular the poor operation of the supply system makes hoarding almost a rule of economic rationality for the Soviet factory manager.

For anyone who has shopped both in Soviet and American stores, the conclusion in the case of trade is harder to credit. The typical Soviet retail store appears to be very inadequately stocked with goods compared to an American supermarket or department store. But the statistical basis for the conclusion in respect to trade is direct and precise enough to leave little room for doubting it. The explanation must lie in such weaknesses as excessive links in the distribution system, improper distribution of inventories throughout the system, the accumulation of unsaleable stocks, and slowness in transportation.

The implications of these high inventory requirements are not hard to see. The difference between the American ratios and the Soviet ratios represents a tying up of resources in the Soviet economy that could well be used elsewhere. And from another point of view, one particularly relevant to the Soviet case, they represent a burden on economic growth. The excessive inventory increments associated with expanding production are greater than they need to be, and represent a deduction from resources available for investment in fixed capital. It remains only to describe this burden roughly in quantitative terms. It was estimated in Table 1 that the inventories in industry on January 1, 1956 amounted to 227 billion rubles. If the rate of turnover of Soviet inventories were raised to the American level, i.e., if the ratio of output to inventories were raised from say 4 to 6, the inventory requirement in industry would be reduced by a third, i.e., about 75 billion rubles. The magnitude of this waste is seen by measuring it against the total gross investment in the Soviet economy of 150 billion rubles in 1955. At the same time, of course, this wastefulness represents a reserve for the Soviet system: to the extent that these inventories could be freed, they would constitute a source of future growth.

## THE FIRM IN ILLYRIA: MARKET SYNDICALISM

By BENJAMIN WARD\*

The discussion of the feasibility of socialism has long been closed with apparently quite general agreement that an economy will not inevitably collapse as a result of nationalization of the means of production. On the theoretical side the clinching argument was probably made by Barone shortly after the controversy began [2]. Probably the best known of the arguments on the other side of the question, that of Mises [15], was published twelve years after Barone's paper and gave rise to a new set of arguments, among them those of Taylor, Lange and Lerner [11] [12]. Lange in fact explicitly (though perhaps with a touch of irony) developed market socialism as a counterexample for Mises' assertions.

Today one might be inclined to take market socialism as something more than a theoretical counterexample. But as a serious proposal for social reform it leaves some important questions unanswered. For example the problem of the emergence of a bureaucracy in whose hands the economic power is largely concentrated was raised by Lange himself. Another unanswered question has to do with the behavioral response of decision-makers to such directives as the rules for determining output and changing price. Will the rules be simply obeyed or will various means of simulating compliance while serving other ends be developed?

These two questions are of special interest today as one watches some Eastern European countries groping toward a less centralized form of economic organization, and as one watches Western European socialists struggle with the implications for democracy (and efficiency) of further nationalization. In the present paper a few of the implications of one possible alternative form of industrial organization are explored. In this model the means of production are nationalized and the factories turned over to the general management of elected committees of workers who are free to set price and output policy in their own material self-interest. The nature of the resulting price and output

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decisions are investigated and compared with those obtained in the competitive capitalist (or market socialist) model.

The assumptions of the model bear a close resemblance to the legal status of the industrial firm in Yugoslavia in recent years. Consequently some of the organizational arrangements of a "market syndicalist" economy can be described most conveniently by citing laws on the statute books in Yugoslavia, as is done in Section I. Toward the end of the paper some comments are made as to the extent of deviations of firm behavior in Yugoslavia from that of the theorems of our model. It seems that Illyria is in fact an alternative to the existing system in Yugoslavia as well as to those in Western and the rest of Eastern Europe.

### *I. Legal Aspects of a Market Socialist Economy*

The legal framework of the Yugoslav economy has been undergoing such rapid and repeated overhaul during the past seven years that it is difficult to pin down the provisions that are relevant at any one point in time. In what follows reference is mainly to the year 1954. Of first importance in releasing the firm from its former Stalinist constraints was the new planning system.<sup>1</sup> Federal and republican plans no longer prescribed output norms for firms and industries. Figures in the central plan represented generalized expectations rather than explicit norms. The firm itself in its own "independent" plan set its own goals for the year and even then was not penalized for failure to fulfill these targets.

The firm was not only empowered to set its own rate of production but was also made responsible for its sales. The compulsory distribution plan was abolished [17, No. 17, 1952, item 169], and the firm was permitted to enter freely into contracts for the sale of its output and the purchase of raw materials. Prices had gradually been released from central control until here too the firm had the right to price its own products "on the basis of market conditions."<sup>2</sup> Price controls still existed in 1954 but only for a narrow range of commodities.<sup>3</sup>

With output norms no longer available for the purpose, the new criterion of successful performance of the firm became profitability, that is to say, the ability to earn enough in revenue to cover costs at

<sup>1</sup> [17, No. 58, 1951]. The 1954 plan is published in [17, No. 13, 1954, item 146].

<sup>2</sup> This had been carried out for certain classes of firms and industries during 1950-51 (for example price-setting in the case of textile products by the price bureaus of the Ministry for Domestic Trade was abolished by a decree published in [17, No. 48, 1951, item 454]). The general statute appears in [17, No. 32, 1952, item 382].

<sup>3</sup> Prices of some industrial raw materials (e.g., pig and cast iron and sawn timber) were fixed by decree during 1954 [17, No. 20, item 221; No. 26, item 295; No. 32, item 407]. The Federal Price Office was re-established early in 1955 [17, No. 22, 1955, item 225] but there was no significant increase in the number of controlled prices at the time.

the existing market prices. The term "revenue" means roughly what it would mean to an American businessman. However, the term "costs" requires some discussion in view of certain aspects of the wage system and of the fact that the state retained ownership of the means of production.

Labor cost was defined by law [17, No. 52, 1953, item 439] and was based on the average level of skill of workers in the industry. Industries were divided into eight groups on this basis and the labor cost per worker-month set for each group. For example, a coal mining concern, falling in Group III, was assigned a calculated (*obračunski*) wage of 8,100 dinars per worker-month. If the firm employed a staff of 100 for a full month of work, labor cost would be 810,000 dinars for the month. The calculated wage was not the same thing as the contractual wage, which was the basis on which a worker was hired. This latter could be set freely by the firm. The distinction was that the contractual wage was *not* an accounting cost and was set by the firm, while the calculated wage *was* an accounting cost and was set by the state.

Secondly, there was the problem of charging the firm for its use of the state-owned land, plant and equipment. Ground rent was to be charged industrial firms at the same rate as that charged on the "largest class of arable land in the district" [17, No. 53, 1953, item 456]. The latter was set on a cadastral basis in accord with the yield of the land. Capital, that is to say plant and equipment, including the more expensive tools, was revalued during 1953 on a basis which does not seem to have been described explicitly in the press.<sup>4</sup> The social (i.e., federal) plan was then to set each year the rate to be paid to the state as interest on fixed capital. A standard rate of depreciation on the various types of equipment was prescribed by the state and payments sufficient to maintain the value of the equipment were also charged as costs against the firm [16, pp. 128-32, 165-67].

Under this system then, costs would be the sum of material costs, "regular contributions" to the state (i.e., the interest charge on fixed capital, ground rent and the excise tax on sales, where levied—a relatively insignificant item in 1954), the calculated wage fund and interest on short-term credit outstanding. Profits, i.e., revenue less costs so-defined, became the measure of success of the firm.

To lend point to this change in perspective, a bankruptcy law was promulgated.<sup>5</sup> Several types of receivership were defined, but in general it was provided that a firm became bankrupt if it was no longer able to

<sup>4</sup> D. Misić [14] says that capital was to be valued at its "real present value, taking account both of its economic obsolescence and the extent to which it is worn out."

<sup>5</sup> [17, No. 51, 1953, item 425]. An earlier law [17, No. 57, 1951, item 545] is much less specific and does not define the conditions under which a decree of bankruptcy against a firm will be passed.

make its regular payments to the state and to pay wages out of its revenues at the rate guaranteed by the state.<sup>6</sup> Included was a provision permitting reorganization of the firm after writing down existing debts, provided the creditors were agreeable.

The new organization was designed to increase the efficiency of the economic system via competition among firms. As Vice-President Karelj put it, "... stimulative elements ... appear above all through the interest of the enterprise in achieving, through free competition with other enterprises on the market, the best results as regards quality and quantity of goods, lower costs of production and good marketing" [10, p. 135]. The firm's incentive to participate in this competition with its fellows stemmed from two sources: workers' management and a profits-sharing scheme. The former had been established in 1950 [17, No. 43, 1950] and provided for an elected council of workers in the firm which was to serve a general policy-making function. The council approved the independent plan of the firm and the wage schedule and was empowered to issue directives regarding execution of the plan and the management of the firm. These were binding upon the firm's director, providing they did not conflict with existing laws and decrees. Day-to-day supervision of operations was entrusted to the management board (*upravni odbor*),<sup>7</sup> a subcommittee of the workers' council which also prepared drafts of the plan and the wage schedule for the approval of the workers' council. Differential wages within the firm were thus set by the workers themselves under this law and the later planning law, the chief constraint being that no wage rate could be set below that in the state minimum wage law.<sup>8</sup>

The calculated wage rates were supposed to be set at levels which would add up to 90 per cent of the total contractual wages at the planned production rate and sales price. If the workers were to receive the contract wage then it was necessary for the firm to make a profit on its operation [1, p. 44]. Furthermore, any profits achieved by the firm were placed at the disposal of the workers' council to be used either for investment or rationalization or to be paid out as a wage supplement in proportion to the contract wage received by each worker,<sup>9</sup> though a

<sup>6</sup> In 1954 the state guaranteed up to 80 per cent of the calculated wage fund of the firm. A firm could apply to the state bank for a loan to cover up to 90 per cent of this fund, but the bank could refuse the loan if it thought the chances of repayment were not good. Guarantee of the loan by the local government (*narodni odbor* or "people's committee") was often required [17, No. 5, 1954, item 57].

<sup>7</sup> The director was a member ex officio of the management board.

<sup>8</sup> [17, No. 7, 1952, item 108] [17, No. 56, 1953, item 484]. Worker skills were classified in [17, No. 57, 1950, item 508], and minimum compensation fixed for each grade.

<sup>9</sup> There are several qualifications to this statement. Some portion of the profits was to be used for the building up of a reserve fund and the local government received a share as well [1, p. 44].

steeply progressive profits tax was levied on this supplementary wage fund.

While the Yugoslav economic system thus involves a considerable measure of autonomy for the firm, it should not be thought that independence of the sort possessed within the legal framework of capitalism has been acquired by the Yugoslav firm. The state reserves the right to intervene directly to alter any decisions of which it disapproves.<sup>10</sup> Such intervention could occur legally as a result of new decrees of the government or by means of the exertion of influence via the trade unions, the League of Communists, or the local governments, rights whose legal sanction was often based on the right of approval of the firm's decisions.<sup>11</sup> But intervention was now to be viewed as the exception rather than the rule.<sup>12</sup>

## II. *The Competitive Firm: The One Output-One Variable Input Case*

The Illyrian firm operates in an environment rather similar to the legal environment within which the Yugoslav firm operates. In Illyria however there will be no intervention by the state in the firm's decision-making process, nor does minimum wage legislation exist. The worker-managers are free to set firm policy under the influence of the profit incentive.

The firm to be considered in this section operates in a purely competitive market. Decision-making is concerned with the short run and is viewed as static in nature; that is, the worker-managers are interested in maximizing their individual incomes over a given period of time. The services available to the firm are labor, which is a homogeneous input, and a fixed plant, which is owned by the state and operated by the workers. The firm must pay a tax in the form of interest on the replacement cost of the plant. Ground rent, depreciation, working capital and other taxes will be ignored. The state sets the calculated wage rate  $w$ , but this is done merely to provide an accounting definition of labor cost and does not determine in fact the level of wages.<sup>13</sup> The workers never plough their profits back into the firm, but in each period

<sup>10</sup> An official statement in vindication of the use of this right by Vice-President Kardelj can be found in [10, p. 133].

<sup>11</sup> The people's committee had the right of approval of the firm's independent plan (see planning law cited above, footnote 1) and the trade unions had some special rights of intervention in the hire-fire decision [17, No. 26, 1952, item 306].

<sup>12</sup> Such action is termed "administrative intervention" by Yugoslav economists and is asserted to have been ubiquitous under the previous Stalinist form of economic organization. A principal reason for establishing the new system was to make such actions unnecessary. See for example [13, pp. 95-100, 113 ff., 131-32, 224 ff.] [18, pp. 238 ff.].

<sup>13</sup> In Yugoslavia the setting of the calculated wage performs an important function in determining the portion of the firm's wage bill that comes under the progressive surplus profits tax, but we are ignoring this tax in the Illyrian case.

distribute the whole amount of profits as a wage bonus. In our firm, which employs a single skill-type of worker, the distribution is made equally to each employee.

A production function will describe the technical conditions under which the firm may transform the homogeneous factor labor,  $x$ , into a salable product,  $y$ :

$$(1) \quad y = f(x).$$

Over the range of the variables under consideration the marginal product of labor will be assumed to be positive but declining as output increases. Labor input will be measured in terms of the number of workers employed. By assuming that labor input can be changed only by varying the number of laborers the possibility of overtime work by the existing staff is eliminated. This is done so as to avoid introducing the marginal disutility of labor as an important constraint.<sup>14</sup> It is also assumed that there is no discrimination among workers, and that a decision to lay off workers on profit-maximizing grounds would not be affected by the fact that the result would be to create unemployment.<sup>15</sup>

The sole source of income to the firm is from the sale of its product at the parametric price  $p$ . Two costs are incurred in production: labor cost which is valued at the calculated wage  $w$  per worker,<sup>16</sup> and the fixed charge for the use of capital  $R$ . Profit of course is the difference between revenue and cost. The worker-managers, acting in their own material self-interest, are not necessarily interested in maximizing profits as their capitalist counterparts, the stockholders or entrepreneurs, would be. Each worker is interested in maximizing his own wage income. The workers as a group, corresponding to the group of stockholders in capitalism, are interested in adopting policies which will maximize

$$(2) \quad S = w + \frac{\pi}{x}$$

where  $\pi$  represents profits.

The last term of equation (2) can be divided into two parts since

<sup>14</sup> The Yugoslav wage law cited above provides that time-and-a-half be paid for overtime work, but that such work cannot be paid for unless prior authorization has been obtained from the local government. Apparently there was a tendency to hog the work which, reasonably enough, was frowned upon by the authorities in a labor surplus economy.

<sup>15</sup> The management board has the final decision in the matter of hiring and firing in the Yugoslav firm (with the exception noted above, fn. 11). If it is assumed that the board is composed of workers of relatively long tenure in their employment in the firm, so that they would not be personally affected by a decision to reduce output, aside from the favorable effect on their own income, this assumption may seem reasonable.

<sup>16</sup> All workers and employees, including those whose wage cost to the firm would ordinarily be considered as overhead, are included in the wage cost  $wx$ , as a matter of convenience.

average profits per worker consists of the difference between average revenue per worker,  $U$ , and average cost per worker,  $K$ . The firm will then choose that output which will make the positive difference between  $U$  and  $K$  a maximum. This would be the output at which

$$(3) \quad dU/dy = dK/dy.$$

This is the Illyrian equivalent of the capitalist condition that price will equal marginal cost under rational management, or of the market socialist rule that managers act so as to set marginal cost equal to price. The Illyrian condition states that wages per worker (or, what amounts to the same thing, profits per worker) are maximized if the competitive firm chooses the output at which marginal revenue-per-worker equals marginal cost-per-worker.<sup>17</sup> This condition has more in common with the capitalist "rule" than with the Lange-Lerner rule. For the Illyrian rule represents the *result* of behavior of a specified kind (wage-maximizing behavior), as does the neoclassical rule (profit-maximizing behavior). In the market socialist economy of the Lange-Lerner type however, the managers are *directed* by the state to act in a certain way, the rule not being connected explicitly with the motivations of the managers.

Equilibrium for the Illyrian competitive firm is described graphically in Figure 1, where the values of  $U$  and  $K$  are plotted against  $x$ . The solution is not altered by making  $x$  rather than  $y$  the formal choice variable.  $U$  has its maximum value at the point at which marginal and average product are equal<sup>18</sup> and declines as the number of workers is either increased or decreased from this value.  $K$ , representing average costs per worker, is equal to

$$w + \frac{R}{x}.$$

This curve is a rectangular hyperbola asymptotic to  $x=0$ ,  $K=w$ . Profits per worker reach a maximum when the difference between  $U$

<sup>17</sup> Marginal revenue-per-worker, it will be noticed, is not the same thing as marginal revenue per worker. The former measures the change in average revenue per worker brought about by a small change in output, while the latter measures the average marginal revenue per worker. In symbols, marginal revenue-per-worker is:

$$\frac{d(py/x)}{dy} = p \cdot \frac{x - yx'}{x^2}$$

while marginal revenue per worker is:

$$\frac{d(py)/dy}{x} = \frac{p}{x}.$$

<sup>18</sup> From the preceding footnote it can be seen that marginal revenue-per-worker will be zero when  $x/y$  equals  $x'$ . The shape of the production function ensures that this will be a maximum value for  $U$ .

and  $K$  is greatest, which is the value of  $x$  for which the slopes of  $U$  and  $K$  are equal. This is point  $b$  of Figure 1.

What is the meaning of this equilibrium? How does it compare with the equilibrium position of the traditional firm? We may consider first the effects of changes in the parameters on the Illyrian firm's behavior, and then contrast the equilibrium positions of Illyrian and capitalist firms under similar technological and market conditions.

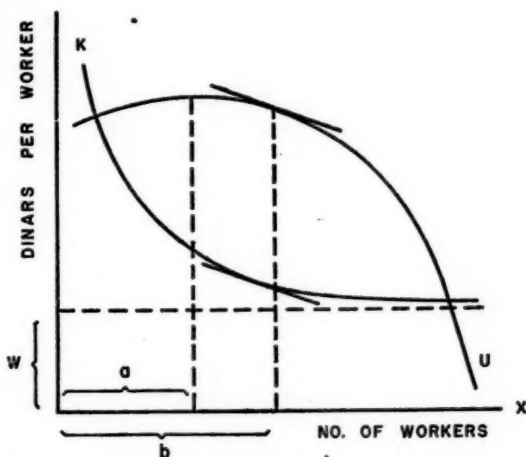


FIGURE 1

Referring to Figure 2, suppose that the firm is in equilibrium producing, under revenue and cost conditions represented by  $U_1$  and  $K_1$ , an output corresponding to the level of employment  $a$ . The state now raises the interest rate, so that  $R$  is increased. This shifts the cost curve up to  $K_2$ . But at the output corresponding to  $a$ , curve  $K_2$  is steeper than is  $U_1$ .<sup>10</sup> That is to say, at employment level  $a$  the rate of decrease of average cost per worker is greater than the rate of decrease of average revenue per worker. Consequently it will be to the workers' advantage to raise output until average cost and average revenue per worker are decreasing at the same rate. In Figure 2 this is represented by employment level  $b$  where the slopes of  $U_1$  and  $K_2$  are equal. This result can be generalized into the theorem: *A change in the fixed costs of the competitive Illyrian firm leads to a change in output in the same direction.*

<sup>10</sup> Since  $K = w + (R/x)$ ,  $dK/dx = -R/x^2$ . Therefore, if  $R_2 > R_1$ ,  $|dK_2/dx| > |dK_1/dx|$  at  $x = a$ .

Further increases in  $R$  would lead to further increases in output. If  $K_3$  were the relevant cost curve the firm would be earning zero profits. Even if  $R$  were increased beyond this point output would continue to increase, as the worker-managers strove to minimize losses. Under these circumstances the workers would be receiving less than the calculated wage  $w$ . So long as no better alternatives were available elsewhere the workers would continue to work in the given firm despite this fact, under our assumptions.<sup>20</sup> Decreases in  $R$  of course have the opposite effect. At  $R = 0$ , the cost function becomes  $K_4 = w$ , and output would

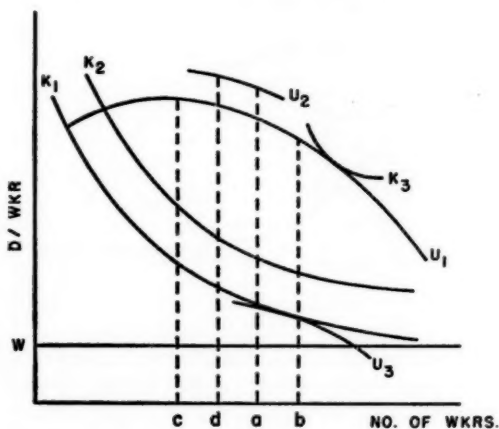


FIGURE 2

be at the level corresponding to the maximum value of  $U_1$ . A negative interest rate would convert  $K$  into a hyperbola asymptotic to the same lines as before but located below  $w$  on Figure 2. Employment would be less than  $c$  and the competitive Illyrian firm would be in equilibrium with average costs falling.<sup>21</sup>

Price changes may be considered in a similar way. Suppose that an increase in demand for the industry's product leads to an increase in the market price  $p$  of our firm, which is currently in equilibrium at

<sup>20</sup> In Yugoslavia wages up to 80 per cent of the calculated wage are guaranteed by the government. If this were true of Illyria, then at outputs beyond that which yielded  $0.8w$  to the workers the maximization criterion would cease to apply. Continued operation at such a level would eventually lead to bankruptcy.

<sup>21</sup> As in capitalism this would only be true over the range in which marginal product was declining. Beyond that range the second-order condition for equilibrium would not be satisfied, so that if a solution existed it would not be a maximum. It may also be noted that over this range of values the supply curve would be positively sloped.

employment level  $a$  of Figure 2. This will shift  $U_1$  upwards to position  $U_2$ . But at the current employment level  $U_2$  will be steeper than  $K_1$ .<sup>22</sup> That is, at  $a$  the rate of decrease of average revenue per worker is greater than the rate of decrease of average cost per worker. Output and employment will contract until these rates are again equal as at employment level  $d$ . Our theorem is: *A change in price to the competitive Illyrian firm leads to a change in output in the opposite direction.* ✓

The lower limit to a price-induced output contraction is, roughly speaking, at employment level  $c$  where average and marginal product are equal. If falling price were to shift the revenue curve down to  $U_3$  a zero profits position would have been reached. The remarks above regarding operations at a loss would of course apply equally if falling price rather than rising fixed costs were the cause of the losses.<sup>23</sup>

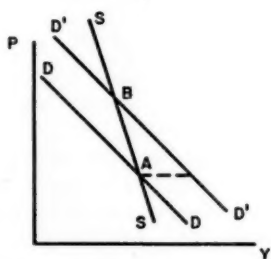


FIGURE 3

Under the usually hypothesized market and technological conditions the Illyrian competitive firm possesses a negatively sloped supply curve. This does not mean however that Illyrian competitive markets are inherently unstable. For example, Figure 3 depicts the industry supply

<sup>22</sup>  $dU/dx = (p/x)[y' - (y/x)]$ . Hence if  $p_1 > p_0$  then  $|dU_1/dx| > |dU_0/dx|$  at  $x = a$ .

<sup>23</sup> The effects of changes in  $p$  and  $R$  can perhaps be seen more clearly by considering the equilibrium condition:

$$(4) \quad \frac{dS}{dx} = \frac{p(xy' - y) + R}{x^2} = 0$$

or

$$(5) \quad \frac{y}{x} - y' = \frac{R}{px}$$

Thus the right-hand term of (5) measures the difference between average and marginal product in equilibrium, which will be positive (decreasing average product) if  $R$  is positive. But the difference between average and marginal product is a monotonic increasing function of output beyond the point of maximum average product (at which point the difference is nil). So, from equation (5), if  $R$  is increased, the difference between average and marginal product, and hence equilibrium output, will be increased. On the other hand an increase in  $p$  means a decrease in the difference between average and marginal product, and hence a decrease in equilibrium output.

and demand curves in such a market. If demand were to shift from  $DD$  to  $D'D'$  point  $A$  would no longer be an equilibrium position. If this is a "price-adjusting" market in the usual sense, the adjusting mechanism is such that the direction of movement of price over time has the same sign as the amount of excess demand. In the diagram excess demand is now positive, so price increases and eventually equilibrium is restored.

On the other hand, if the demand curve has a steeper slope than the supply curve the adjusting mechanism described above will lead away from equilibrium and the market will be unstable. To be assured of stability this possibility must be avoided, which means that some further constraint must be imposed on the structure of the firm specified above.<sup>24</sup> The problem of instability is most likely to arise when product demand is relatively inelastic, or when marginal product is relatively large and declining slowly as output increases.

If the state changes the calculated wage  $w$  there is no change in any of the variables relevant to the firm. The  $K$  function (*cf.* Figure 1) shifts vertically up or down as a result. The income of the workers is unchanged, though relatively more income is in the form of profits (if  $w$  is reduced) and relatively less in the form of wages.<sup>25</sup>

The Illyrian equilibrium can now be contrasted with its capitalist counterpart. Consider two firms, one in Illyria, the other in a capitalist country. They have identical production functions and are operating in purely competitive markets. In addition, market prices are equal in both cases, as are fixed costs, and the Illyrian calculated wage  $w_l$  equals the going capitalist wage  $w_c$ . In Figure 4 the  $U$  and  $K$  functions describe the revenue and cost positions of the Illyrian firm under alternative levels of employment. The rates of change are also drawn in. At the intersection of the latter the Illyrian firm is in equilibrium, producing the output corresponding to employment  $x_l$ .

In describing the equilibrium of the capitalist firm it will first be noted that  $U$  also expresses the value of the average product of the capitalist firm under our assumptions, since  $U = py/x$ . The capitalist value-of-the-marginal-product function bears the usual relation to  $U$ , and the capitalist output is found at the point  $x_c$  where  $VMP$  equals the wage, since output  $y_c$  is a single-valued function of labor input.<sup>26</sup>

In the diagram the capitalist output exceeds that of the Illyrian firm. But this need not be the case. For example, by increasing  $w_c$  it would be possible to reduce the equilibrium output level of this firm to the Illyrian level or even below. Under our assumptions a necessary and

<sup>24</sup> See the Mathematical Appendix.

<sup>25</sup> See note 13 above.

<sup>26</sup> We are assuming that the capitalist firm too can vary only the number of workers employed and not the hours of work.

sufficient condition that the outputs of the two firms be equal is that the equilibrium marginal products be equal. The capitalist value of the marginal product is equal to  $w_0$ . In Illyria the value of the marginal product is equal to the "full" wage, *i.e.*, the calculated wage plus the profits share to each worker.<sup>27</sup> Therefore the Illyrian full wage equals the capitalist wage and equality of outputs implies zero profits.<sup>28</sup>

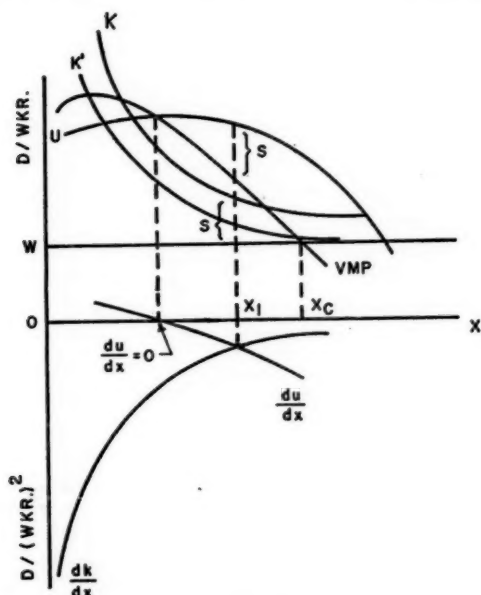


FIGURE 4

Thus the Illyrian firm is capable of producing in the short run at a level equal to or even greater than that of its capitalist counterpart. And the state can affect output decisions of the firm via its ability to alter the parameter  $R$ . If it is willing to use the fixed tax for capital use as an instrument of policy in attaining desired levels of output, and consequently is willing to make discriminatory charges on this basis, it may create an environment in which it is in the material interests of the worker-managers to produce at the competitive capitalist output, or at some other preferred rate. Alternatively, if the industry were in long-

<sup>27</sup>From equations (2) and (5),  $S = (py - R)/x = py'$  in equilibrium.

<sup>28</sup> We assumed at the start that  $w_1 = w_0$ . Since the value of  $w_1$  really does not make any difference, a more significant statement would be: equality of outputs implies equal wages.

run equilibrium in both countries and demand, labor force, etc., conditions were identical, both firms would produce the same output.

Finally, the case of constant average product  $y/x$  may be noted. In capitalism this means one of three things: (1) if  $VMP > w$  the firm produces at capacity; (2) if  $VMP < w$  the firm produces nothing; and (3) if  $VMP = w$  output is indeterminate. In the Illyrian case this means that  $U$  is a horizontal line. The maximum positive, or minimum negative, difference between  $U$  and  $K$  consequently is at infinity whatever the position of  $U$  on the diagram. The Illyrian firm produces at capacity when marginal and average product are equal.

### III. *The Case of Two Variable Inputs*

In Illyria a single class of inputs, labor, is singled out for special treatment. The distinctive features of Illyrian behavior stem entirely from this fact. By extending our previous model to include the use by the firm of a variable nonlabor input, the special position of labor in the firm can be brought out more clearly. The production function will now have the two arguments,

$$(6) \quad y = f(x, z).$$

If the usual assumptions of positive marginal products and diminishing returns to the factors are made, the equilibrium condition for labor use will correspond to that in Section II, i.e., the value of the marginal product of labor will be equal to the full wage. For the nonlabor input however the value of the marginal product will be equal to the price  $v$  of the input.<sup>29</sup> The workers react to changes in nonlabor inputs in the same manner as do capitalists: they will increase their use of the factor as long as it contributes more to revenue than to cost. On the other hand they seem to use a different criterion in evaluating labor use. An additional laborer must contribute more to revenue per worker than to cost per worker in order for him to be employed. In fact, *only* the latter criterion is being employed in the model. It simply happens that the capitalist and Illyrian criteria lead to the same behavior with regard to nonlabor inputs. Whenever one of these factors contributes more to revenue than to cost it also contributes more to revenue per worker than to cost per worker. As a result the equilibrium conditions are the same. However the two criteria do not lead to the same behavior when it comes to labor use. Because each laborer gets a share of the profits it does not follow that an additional worker who contributes more to revenue than to cost will necessarily also contribute more to revenue per worker than to cost per worker. As a result the equilibrium conditions for labor use are not the same in the two regimes.

An analysis of the effects of changes in the parameters  $R$  and  $p$  leads

<sup>29</sup> See the Mathematical Appendix for derivations in the two-variable-input case.

to less clear results in the two-input case than it did in Section II: In the case of a change in fixed costs the analysis may be illustrated by means of the factor allocation diagrams of Figure 5. The curves in 5A are drawn on the assumption of a fixed input of factor  $z$  and those in 5B on the assumption of a fixed level of employment. From an initial position of equilibrium in which  $x_1$  of  $x$  and  $z_1$  of  $z$  are being used, fixed cost is increased. This shifts  $K_1$  upward to  $K_2$ , increasing labor input from  $x_1$  to  $x_2$ , and consequently tending to increase output. However, there is now an additional effect which must be taken into account: namely the effect of the increase in labor use on the marginal product of the nonlabor input. If the latter is unaffected or increases, shifting  $VMP_1$  upwards to  $VMP_2$ , the increase in output is either unaffected or

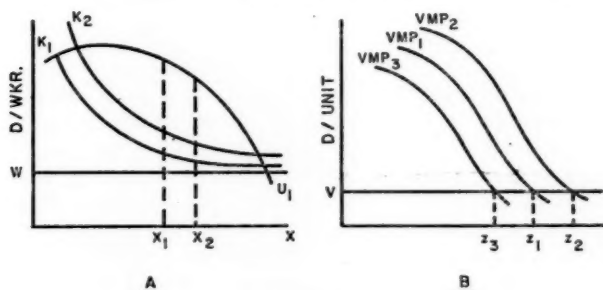


FIGURE 5

magnified. However, if  $VMP$  is reduced by the increased labor use the amount of  $z$  used decreases, and the output effect of the increase in fixed cost is indeterminate by means of qualitative analysis alone. The latter, however, is a rather unlikely eventuality, since in the short run more labor will generally not decrease the usefulness of the other variable factors, and conversely. Consequently a change in fixed cost in the multifactor case will also tend to lead to a change in output in the same direction.

A more serious indeterminacy appears in the analysis of price changes. Without a good deal more information it is not possible to state the effect on output of a change in price. The possibility of a positively inclined supply curve emerges clearly however, and some presumption that the danger of instability, resulting from a negatively inclined and relatively elastic supply curve, has diminished. Whether or not a negatively sloped supply curve will result in the multifactor case depends on the relative importance of labor in the bill of inputs.<sup>20</sup>

Similarly, changes in the parameter  $v$ , the supply price of the non-

<sup>20</sup> Cf. equation (20) in the Appendix.

labor input  $z$ , have indeterminate effects on output. This is also true in the case of analysis of the capitalist firm with the same amount of information, though information sufficient to remove the indeterminacy in one case may not be sufficient in the other.

The statements made in Section I comparing competitive capitalism with competition in Illyria generally apply in the somewhat more complicated two-variable-input case. We will consider here the problem of comparative factor allocation. As before our two firms have identical production functions and are operating under identical market conditions so that:

$$p^I = p^C$$

$$w^I = w^C$$

$$v^I = v^C$$

$$R^I = R^C$$

the superscripts standing for "Illyria" and "Capitalism" respectively.

The situation is described in Figure 6 in which isoquants  $Q_1$  which are identical for both firms are drawn. Let us assume first that the capitalist firm is producing output  $Q_1$ .  $BB$  is the factor-cost line based on the values of  $w$  and  $v$ , so that the capitalist firm is in equilibrium at a factor mix represented by point  $N$ . Let us assume further that the capitalist firm is earning a profit at this level of operation. At the same output the Illyrian firm would be earning a profit too. But it would not be in equilibrium at point  $N$ . This is because  $BB$  is not the relevant factor cost line for the Illyrian firm. Since in Illyria the value of the marginal product of labor is equated to the full wage, i.e., including the profits share,  $BA$ , representing a larger wage "cost," is the relevant one for the Illyrian allocation decision. The Illyrian firm is in equilibrium then at point  $M$ , producing less output and using less labor than its capitalist counterpart.

Suppose now that market price falls to the zero profits point. Capitalist output and factor mix contract along  $Y^C$ , say to point  $L$ . Illyrian output and factor mix contract along  $Y^I$ , but also to point  $L$ , since the zero-profits full wage is equal to  $w$ . If price should fall further so that both firms are incurring losses the full wage will then be less than  $w$ . For example, under conditions which would lead the capitalist firm to produce at  $H$ , the Illyrian firm would produce at  $J$ . The Illyrian firm would produce more than the capitalist firm and would use more labor, so as to spread the losses around among as many of the worker-managers as possible.

The  $Y^I$  line, like  $Y^C$ , is positively sloped in the diagram, indicating that supply responds positively to an increase in price. It is perfectly

possible for  $Y'$  to have a negative slope under suitable cost and technological conditions, but it will still intersect  $Y^0$  at the zero-profits point.<sup>31</sup>

As a final aspect of the multiple-input case we may consider a firm which is highly automated so that labor does not enter significantly into the short-run production function as a variable input. In this case fac-

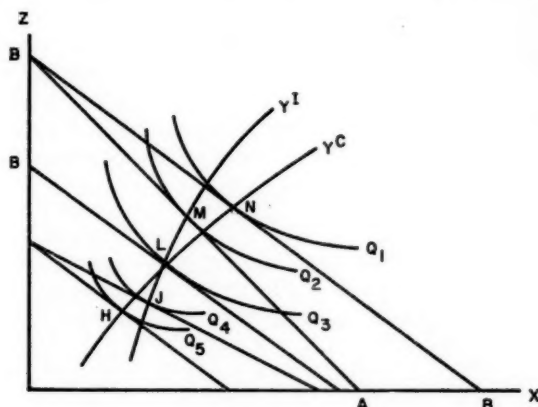


FIGURE 6

tor use and output are determined by the usual equilibrium conditions of capitalism. That is, with a fixed labor force any addition to profits is also an addition to profits per worker. Such a firm would behave in exactly the same way as its capitalist counterpart, equating marginal cost to price and the marginal value products to the fixed input prices.

#### IV. Market Imperfections

Illyria must pay a price for its decentralized pricing system in the form of imperfect markets. For the worker-managers no less than their capitalist counterparts have an incentive to profit from the negatively inclined demand schedule that must in many instances confront them. The whole congeries of market types from monopoly to monopolistic competition, including the usual forms of collusion, could emerge under Illyrian conditions. Alterations in the previous models required to take

<sup>31</sup> Figure 6 may also be used to contrast other comparative static changes. For example, an increase in  $w$  will increase the slope of  $BB'$  without affecting that of  $BA$ . This will tend to move the capitalist equilibrium position at  $N$  closer to the Illyrian at  $M$ . An increase in  $R$  on the other hand will tend to make  $BA'$  less steep without affecting the slope of  $BB$ . This will tend to move the Illyrian equilibrium position at  $M$  closer to the capitalist at  $N$ . When the equilibria coincide in either case profits will be zero.

account of such market imperfections in most instances are not extensive. For example, the monopoly solution in the single-variable-input case can be discussed by means of Figure 2 (p. 574) if the  $U$  function is reinterpreted to take account of the fact that price is now a variable rather than a parameter of the system. That is, any point on  $U$  would now represent the average revenue that would accrue to the monopoly from selling the output the  $x$  workers are capable of producing at the price offered for that quantity by buyers. The result is that factors are used up to the point at which the marginal revenue product equals the (assumed perfectly elastic) supply price in the case of nonlabor inputs, and to the point at which marginal revenue product equals the "full" wage for labor inputs.<sup>32</sup> Output will be less than in competition under the usual conditions.

There is one factor market which exhibits a special rigidity in Illyria; namely the labor market. The situation can be illustrated by assuming away all the customary forms of rigidity in the labor market such as trade unions, barriers to training, imperfect knowledge, etc. If labor is a homogeneous factor well informed and concerned to better its material position as far as possible, we may assume the supply to depend solely on the wage offered. If profits figures are published or otherwise available it is the full wage that will determine the offer of labor power. Suppose that from an initial position of equilibrium the supply schedule for labor shifts up, leading to excess demand. Ignoring the influence of varying employment levels on product demand, the marginal firms are now unable to obtain labor at the going wage rate. But they are also unable to offer higher wages, since the wage rate was already at a maximum. As a result of the rigidity of the wage offer there will be no forces set in motion in the short run to correct a disequilibrium, and the shortage of workers will in itself tend to depress the wage paid by the marginal firms, since profits can no longer be maximized.

If excess supply of labor should develop, a similar rigidity would occur. Workers are willing to offer themselves at lower wage rates, but these rates cannot legally be paid. Consequently the excess supply will persist. Only entry or departure by some firms would be capable of changing the situation; i.e., by changes in the quantities demanded in each case rather than by alterations in the market price of labor.

If profit rates were kept secret it might be possible to create a supply function in which the nominal wage  $w_1$  was the independent variable. In this case, when excess demand appeared the state could raise the nominal rate sufficiently to attract the needed number of workers into the market. This change in the wage would not affect the full wage or

<sup>32</sup> See Appendix, note 2.

the product market positions.<sup>33</sup> That is, it would affect only the supply of labor, not the demand. However it would be rather difficult to keep all information regarding profits from the labor market when all recipients of profits or losses were also workers.

### V. Concluding Remarks

1. The zero-profit output of the competitive Illyrian and competitive capitalist firms will be identical, given the same market and technological conditions for the two firms. This suggests that in the long run the Illyrian conditions under competition could lead to an optimal allocation of resources wherever the capitalist competitive regime would. However we have not discussed conditions of entry in Illyria. Entry could occur either by creation of new firms by the state, or by expansion of existing firms, or by some provision for individual or decentralized group initiative in starting new enterprises. All three possibilities exist in Yugoslavia but it is not possible to discuss them here. It will merely be noted that there is likely to be strong resistance by the Illyrian worker-managers to ploughing back profits, since this would involve a reduction in the current profits share. This will be true if relatively low-income entrepreneurs are likely to be more myopic than relatively high-income ones. Something additional to worker self-interest might well be necessary in the Illyrian environment to ensure entry equivalent to that under capitalism.

2. Market imperfections stemming from the ability of the seller (or buyer) to influence the market price by varying his rate of output lead generally to a lower level of output and a higher price than the competitive rates, in Illyria as in capitalism. This has been a persistent problem in Yugoslavia from the beginning of the new system [7, p. 16] [4, 1953, 2, 443-44] [4, 1954, 3, 841-42] and has led to the promulgation of an "antitrust" law.<sup>34</sup> The state's broad rights of intervention might seem to offer more favorable opportunities for controlling such behavior, but persistent complaints in the Yugoslav press suggest that control of monopoly has not been notably successful.<sup>35</sup> Of course Yugoslavia, being a rather small country with an underdeveloped industrial sector and communications network, and with a balance-of-payments

<sup>33</sup> However, with a progressive profits tax, as exists in Yugoslavia, the full wage will be reduced, *ceteris paribus*, by a decrease in  $w$ , since a larger proportion of the wage bill would become taxable; and of course the full wage would increase with an increase in the calculated wage.

<sup>34</sup> [17, No. 56, 1953, item 483, esp. Article 74]. The language is fully as vague as that of the Sherman Act, among other things forbidding firms from doing anything which leads to a "monopoly position in the market."

<sup>35</sup> See however [4, 1953, 2, 1034] for a description of the refusal of a Yugoslav court to uphold a contract which was in restraint of trade.

problem which has led to a large number of restrictions on competitive imports, has considerable initial disadvantages to overcome in developing a purely competitive market.

3. A special stability problem arises in Illyria, since firms may react to a price change by altering the rate of output in the opposite direction (negatively sloped supply schedule), a situation which is more likely to occur the more important labor is as an input. Since a good deal of new plant has been installed in Yugoslavia since 1952, this would be a difficult hypothesis to test. Indeed, our model does not tell us anything at all about what to expect if there is in fact instability in a market. In addition it is probable that in a large number of Yugoslav firms policy decisions are made by the director without much reference to the wage-maximizing desires of the workers. Though directors also share in the profits, it is likely that other motives also exist for them which might lead to different behavior as regards price and output and input policy.<sup>36</sup>

4. The beginning student of economics would undoubtedly be delighted to learn that in Illyria an increase in fixed costs would really lead to an increase in output so as to spread out the increased burden over a larger number of units. I have seen no evidence to indicate that the Yugoslav authorities have varied the interest rate on existing capital for purposes of output control, though discrimination has been practiced which is consistent with such an aim.<sup>37</sup>

5. The labor market possesses a rigidity which prevents adjustment of supply and demand to restore a displacement from equilibrium. It is true that in Yugoslavia there has been some excess supply of labor at least since the institution of the new economic system in 1952 [4, 1953, 2, 182-83] [9], though this can be explained as well by other factors operating generally in a labor market in an underdeveloped country (and by the successive droughts) as by means of this theorem. In this excess-supply situation some incentive probably exists for the firm to practice a form of illegal discrimination which is related to the specific rigidity described above. This could be done by means of an illegal contract to hire workers who would agree to work for the contractual wage rate for unskilled workers and renounce their right to profits.<sup>38</sup>

<sup>36</sup> See [19] for a discussion of the relative influence of director, management board and workers' council within the firm. For example, directors are often in close contact with local government officials. One possible result of ties of this kind might be profit-maximizing behavior, as mentioned in note 38 below.

<sup>37</sup> [16, pp. 132-33]. In the 1954 plan, for example, the standard rate was 6 per cent, but in some types of construction no interest at all was charged, while elsewhere a rate of 2 per cent was charged. It is certainly true that the state was specially interested in increasing output in the favored areas. It does not necessarily follow however that the planners had the mechanism operative in our model in mind in granting the favors.

<sup>38</sup> A phenomenon known as the "dead brigades" (*mrtvi brigadi*) may have been an instance of this [4, 1953, 2, 1034] [9, p. 487]. For example the coal mining concern men-

Finally, outside pressure by various groups, but especially by the people's committees, the organs of local government, seems to have had considerable effect on decision-making by the firm in Yugoslavia. We will note only one example. The people's committees possess the right to a portion of the profits of every firm within their territory. This has led them to influence the firms' policies and to take other steps to siphon funds from the firms into the treasury of the local government.<sup>39</sup> The actions of local governments and other administrative bodies, plus fears of administrative intervention, undoubtedly result in significant differences in the behavior of firms in Yugoslavia and Illyria. These factors, plus the relatively large role the director seems to play in *de facto* decision-making within the Yugoslav firm, provide the chief limitations to the application of the above analysis to current operations in Yugoslavia. The model's relevance to Yugoslavia may be somewhat increased if it is assumed that the legal framework is descriptive of an ultimate purpose on the part of the Yugoslav leadership.

In summary, market syndicalism differs from market socialism in that in the former (1) both price and output decisions are decentralized to the level of the firm; (2) the workers employed in each firm control policy making; and (3) material interest is the governing incentive. Some of the arguments in favor of market syndicalism as a nonbureaucratic alternative to other forms of socialism would bear a striking resemblance to those of the economic liberal when attacking some tendencies of contemporary capitalism; and conversely for arguments against market syndicalism. However it would not be seemly to discuss these issues until some other properties of the Illyrian economy, such as the investment decision, multiple market stability and macroeconomics, have been investigated.

#### MATHEMATICAL APPENDIX

##### 1. *The Condition for Stability in a Single Competitive Illyrian Market under the Assumptions of Section II.*

From equations (2) and (3) in the text

$$(7) \quad S = \frac{py}{x} - w - \frac{R}{x}$$

tioned on p. 568 above might hire an unskilled worker for 6000 dinars per month, which would add 8100 dinars to the calculated wage fund, i.e., to labor cost in the accounting sense. This would substantially reduce accounting profits and hence the amount of taxation under the steeply progressive profits tax law. If the firm expected to make a fairly high level of profits, this could be to the monetary advantage of the "in-group" workers even if the newly hired worker performed no work at all. From the above descriptions it seems that the dead brigades in fact had little to do. In some cases the dead brigades were in fact "dead souls," fictitious employees.

<sup>39</sup> [8, p. 159] [5]. The people's committee would be interested in the level of profits per se, rather than in profits per worker, so that within the framework of our model such disagreements over price-output policy could arise.

so that

$$(8) \quad \frac{dS}{dy} = \frac{p(x - yx') + Rx'}{x^2} = 0$$

where  $x' \equiv dx/dy$ . The equilibrium condition  $S' = px - pyx' + Rx' = 0$  may be differentiated with respect to the parameter  $p$ :

$$\begin{aligned} \frac{\partial S'}{\partial p} \Big|_R &= \frac{dS'}{dy} \frac{\partial y}{\partial p} \Big|_R + \frac{\partial S'}{\partial p} \Big|_{y,R} \equiv 0 \\ &= (-pyx'' + Rx'')(\partial y/\partial p) + (x - yx') \equiv 0 \end{aligned}$$

or the slope of the firm's supply function:

$$(9) \quad \frac{\partial y}{\partial p} = \frac{yx' - x}{x''(R - py)}$$

But  $(R - py) = -pyx'$ , since the equilibrium is preserved along the supply function. So supply elasticity:

$$(10) \quad \eta_s \equiv \frac{p}{y} \frac{\partial y}{\partial p} = \frac{x'}{xx''} \left( \frac{x}{y} - x' \right) < 0,$$

except over the relatively unimportant range in which average product is equal to or less than marginal product. Note that

$$x'' \equiv \frac{d^2x}{dy^2} = \frac{y''}{(-y')^3} > 0, \quad \text{where } y'' \equiv \frac{d^2y}{dx^2}.$$

We are assuming a price-adjusting market in which the existence of excess demand leads to price increases over time in the case of excess demand and of decreases in the case of excess supply. Such a market will be stable when the supply curve is negatively sloped provided  $\eta_D > \eta_s$ . If we assume that production functions of all firms are identical, elasticity is invariant under the summation from firm to industry supply function. Thinking then in terms of industry demand and firm supply conditions, we have:

$$(11) \quad \eta_D > \eta_s = \frac{x'}{xx''} \left( \frac{x}{y} - x' \right)$$

as a necessary and sufficient condition for stability.

## 2. Monopoly with One Variable Input.

Equation (7) applies in this case, except that  $p$  is now a variable. Assume

$$(12) \quad p = g(y, \alpha)$$

such that  $\partial p/\partial y < 0$  and  $\alpha$ , a shift parameter, is defined so that  $\partial p/\partial \alpha > 0$  and further that  $\partial p/\partial y$  remains invariant under the shift. Differentiating (7) with respect to  $y$  and solving for the first order condition for a maximum ( $y' \equiv 1/x'$ ):

$$(13) \quad y'(p + p'y) = (py - R)/x, \quad \text{where } p' = \frac{\partial p}{\partial y} \Big|_{\alpha}$$

Equation (13) may be differentiated with respect to  $R$  and  $\alpha$ , respectively, and solved for:

$$\frac{\partial y}{\partial R} = - \frac{x'}{2p'x + p''xy - x''(py - R)}$$

and

$$\frac{\partial y}{\partial \alpha} = \frac{(\partial p / \partial \alpha)(x'y - x) - xy \left( \frac{\partial^2 p}{\partial y \partial \alpha} \right)}{2p'x + p''xy - x''(py - R)}.$$

Knowledge of signs tells us that, as long as the demand curve is linear or convex to the origin, a change in  $R$  leads to a change in  $y$  in the same direction. With a similar demand curve, an upward shift in demand of the hypothesized kind will lead to a decrease in output if the firm is operating beyond the point of maximum average product, but an increase in output if average product is still increasing.

### 3. The Two-Variable-Input Case.

$$(14) \quad S = \frac{1}{x} [py - (wx + vz + R)]$$

and

$$(15) \quad \begin{aligned} y &= f(x, z), & y_x &> 0, & y_z &> 0, \\ y_{xx} &< 0, & y_{zz} &< 0, & \text{and } y_{xz}y_{zz} - y_{zz}^2 &> 0. \end{aligned}$$

Applying the first-order conditions for a maximum,

$$(16) \quad \partial S / \partial x = (1/x^2)[p(xy_z - y) + vz + R] = 0$$

and

$$(17) \quad \partial S / \partial z = (1/x)(py_z - v) = 0$$

or

$$(18) \quad py_z = \frac{py - (vz + R)}{x}$$

and

$$(19) \quad py_z = v.$$

Further differentiation of (16) and (17) gives, at the equilibrium position at which (18) and (19) are satisfied,

$$\partial^2 S / \partial x^2 = py_{zz} / x < 0,$$

$$\partial^2 S / \partial z^2 = py_{zz} / x < 0,$$

$$\partial^2 S / \partial x \partial z = py_{xz} / x$$

and

$$\frac{\partial^2 S}{\partial x^2} \frac{\partial^2 S}{\partial z^2} - \left( \frac{\partial^2 S}{\partial x \partial z} \right)^2 = \frac{p^2}{x^2} (y_{xz}y_{zz} - y_{zz}^2) > 0.$$

Therefore equations (18) and (19) determine a maximum. Both the latter equations can be differentiated with respect to  $R$  and with respect to  $p$  and solved for:

$$\frac{\partial x}{\partial R} = \frac{\begin{vmatrix} -1 & (pxy_{zz}) \\ 0 & (py_{zz}) \end{vmatrix}}{p^2x \begin{vmatrix} y_{zz} & y_{zz} \\ y_{zz} & y_{zz} \end{vmatrix}} > 0,$$

$$\frac{\partial z}{\partial K} = \frac{\begin{vmatrix} (pxy_{zz}) & -1 \\ (py_{zz}) & 0 \end{vmatrix}}{p^2x \begin{vmatrix} y_{zz} & y_{zz} \\ y_{zz} & y_{zz} \end{vmatrix}} \lesseqgtr 0,$$

$$\frac{\partial x}{\partial p} = \frac{\begin{vmatrix} (y - xy_z) & (pxy_{zz}) \\ (-y_z) & (py_{zz}) \end{vmatrix}}{p^2x \begin{vmatrix} y_{zz} & y_{zz} \\ y_{zz} & y_{zz} \end{vmatrix}} \gtrless 0 \quad \frac{\partial z}{\partial p} = \frac{\begin{vmatrix} (pxy_{zz}) & (y - xy_z) \\ (py_{zz}) & (-y_z) \end{vmatrix}}{p^2x \begin{vmatrix} y_{zz} & y_{zz} \\ y_{zz} & y_{zz} \end{vmatrix}} \gtrless 0.$$

The slope of the supply function at the equilibrium point,

$$\begin{aligned} \frac{\partial y}{\partial p} &= y_z \frac{\partial x}{\partial p} + y_z \frac{\partial z}{\partial p} \\ (20) \quad &= \frac{[y_{zz}y_z(y - xy_z) - xy_z^2y_{zz} + y_{zz}(xy_zy_z - yy_z + xy_z)]}{px(y_{zz}y_{zz} - y_{zz}^2)} \gtrless 0. \end{aligned}$$

The denominator is positive, but the numerator is undetermined in sign with the specified information.

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## PROGRESSIVE TAXATION IN AN INFLATIONARY ECONOMY

By E. J. MISHAN AND L. A. DICKS-MIREAUX\*

The impact of progressive taxation on variations in aggregate income is of general interest for at least two reasons. First, as a consequence of the postwar inflation, there has been a growing awareness in all sections of the community of the burden of income taxation. Second, it is of importance to economic theorists, in particular to those who hope to influence policy, to have some idea of the magnitude of the so-called "built-in stability" effect of progressive taxation when confronted with large variations in aggregate income as well as small.

Though some useful work has been done with the aim of estimating the amount of built-in stability, the methods used have been such as to limit the findings to strictly comparable aggregate incomes<sup>1</sup>; or in those cases where an extension of the same methods to widely varying incomes was conceivable in principle, in practice it would have proved too laborious to undertake.<sup>2</sup> The particular virtue of the method pre-

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<sup>1</sup> For instance, R. A. Musgrave and M. H. Miller [3] suggest a coefficient of built-in stability (or what they call "built-in flexibility"),  $\alpha$ , defined as  $1 - \frac{\Delta Y}{\Delta Y_0}$ , where  $\Delta Y$

is the resultant increment of income in response to an autonomous increase of investment with the given structure of taxes, while  $\Delta Y_0$  is the hypothetical increment of income in the absence of any income tax. Thus " $\alpha$  is the fraction of change in income which is prevented because of built-in flexibility." They separate two factors, (i) the average level of

tax rates  $r$ , and (ii) the income elasticity of taxes,  $E = \frac{\Delta T}{\Delta Y} \cdot \frac{Y}{T}$ , in order to indicate the possibility of increasing  $\alpha$  by raising  $E$  while maintaining or lowering  $r$ . With a current  $r$  estimated at about .2, and an  $E$  estimated at about 1.5,  $\alpha$  is little over one-third at the existing (1948) yield levels.

For limited movements of income from current levels, the marginal tax arrived at by their methods is satisfactory enough. The estimates for  $E$  and  $r$ , however, would not be suitable for measuring changes in income-tax revenue for appreciable change in aggregate income even if we could neglect changes wrought by alterations in the income structure. For instance, granted that tax rates remain unaltered, the onset of a mild but persistent inflation would shift income earners into successively higher tax brackets with the result that the marginal tax would advance faster than income.

<sup>2</sup> For instance, J. A. Pechman [4] has calculated the total of personal income taxes which the population would have paid in the years 1948-52 at the 1953 tax rates given the income distributions for each of these years. His method is to distribute the total of taxable income of each income group among the relevant tax brackets, the amounts in each being

sented in this paper is that, if the assumptions about tax characteristics are accepted, the calculation of total income-tax yields for any variation in aggregate income becomes a relatively simple procedure. Not only can we compare, for example, the growth in tax yields for different rates of inflation, but international comparisons of progressiveness and built-in stability become feasible. While we shall confine our attention to the U.S. economy, employing the tax structure existing in 1953, the data used, though accurate enough to warrant our conclusions, are of subsidiary importance only, serving simply to illustrate the method.

First, a word about the usefulness of comparing tax yields for widely varying levels of aggregate income on the basis of the tax structure of a particular year. If an inflation is prolonged, a government may lower its rates of income taxation. In fact during the postwar period income-tax rates were lowered both in the United States and the United Kingdom, though not sufficiently to preclude the governments of these countries from collecting increased revenue. Furthermore, if a government did maintain the level of taxes or did not appreciably lower them during a period of prolonged inflation, the tax yield might not increase in legitimate proportion as a consequence of growing tax evasion by those sections of the community more advantageously placed for this practice. Yet the question to be answered here is not the less interesting because of these and similar considerations. Indeed, the pressure on governments to reduce taxation during an inflationary period, and the growing temptation of nonemployed income earners to evade it, cannot be properly appreciated without some notion of what we may call the *virtual* growth of the tax yield—the growth of the tax yield that would occur if all means directed toward mitigating its incidence were held in abeyance.

In a first calculation we shall include only personal income taxes. Both corporation and indirect taxes will, however, be included in a second calculation in which the amount of all taxes other than income taxes will be assumed to remain proportional to aggregate money income.<sup>3</sup>

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taxed at the 1953 bracket rate. His estimate of built-in stability,  $T/Y$  was between 16 and 19 per cent over the years 1948-53.

If this method were to be used to estimate tax yields of income in future years assumptions about the income structure and the possibly changing tax characteristics of income earners in each income group would be necessary. Pechman does not attempt this however; he estimates only what built-in stability was. On the other hand, if Pechman's methods were used to estimate built-in stability for projected aggregate income levels, it would require a prohibitive amount of calculation for aggregate incomes associated with even a limited range of rates of inflation or deflation over a few years.

<sup>3</sup> It might occur to the reader that if we experiment with unchanged tax rates for personal incomes we should extend the experiment to all other taxes. Yet if, instead of using

We shall also want to measure what we call the tax-income ratio, defined as the ratio of the revenue which the government would collect, if all taxes in question were duly paid, to the aggregate of personal incomes of the entire population. Its calculation, however, will depend upon the postulates we make in order to isolate the problem and upon the simplifications necessary to make the calculations manageable.

In regard to the postulates, while we are chiefly interested in the effects on taxation of varying rates of inflation, an increase of money income occasioned solely by a rise in productivity will bear the same additional income tax as an equal increase of money income which is the result purely of a rise in the general level of prices, provided always that the trend in income distribution is common to both contingencies. We are therefore under no obligation at the outset to state whether the growth of money income is the result of one factor or of the other or of both of them. This is an advantage, for with the results we reach on the basis of an expanding money income we may estimate the portion of the national income which ought to accrue to the government for various combinations of inflation and productivity.

No growth or decline of the population, natural or migratory, is allowed for. For the measurement of the tax-income ratio this restriction is not at all serious. If we supposed, as we might without incredulity, that the distribution of income of any additional population was similar to that of the initial population an allowance for additional population would not affect this ratio.

As a first approximation we shall assume that any increment in the total money income of the population is divided in equal proportion among them: each income-earner, that is, experiences the same percentage increase in his money income. Needless to say, there have been significant changes in the structure of gross incomes over the postwar period—broadly speaking, relative gains were made by unskilled and semiskilled workers, relative losses by salaried professionals—but even if this trend should continue further, any endeavour to allow for it may be considered a refinement not to be pursued here.

Section I develops a general method of deriving the required equation, aggregate income-tax yield as a function of aggregate income. In Section II the adoption of a particular form of tax function is shown to result in a further simplification of work. Section III gives the estimates of tax yields for a wide range of aggregate income levels using the 1953 tax rates.

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our obviously tentative conjecture about the time-path of all other taxes, we were to break them down into several categories (say, specific excise taxes, ad valorem excise taxes, corporate taxes, and capital taxes, with perhaps some further subdivisions) it would be unlikely to alter the general impressions which emerge from the tables which include all taxes.

### I. The Method of Calculation

Ideally, if we suppose total money income to have risen by, say, 10 per cent we should, following our first approximation, add 10 per cent to the income of each income-earner in the given population. The larger tax that each income-earner has to pay may be easily calculated by referring to the appropriate tax tables and the total of taxes so calculated may be expressed as a percentage of the now larger aggregate money income. Though straightforward enough, this method is hardly practicable in a community comprising more than a few income-earners. For the size of populations we are dealing with we have no choice but to divide them into income groups. The smaller the range of each

TABLE 1.—PERSONAL INCOMES AND INCOME TAX LIABILITY, 1953

Income Group (\$ thousands per year)	Number of Taxpayers	Adjusted Gross Income (\$ millions)	Income Tax Liability (\$ millions)
0-2	6,780,709	9,281	752
2-3	7,021,539	17,640	1,683
3-5	15,868,939	63,051	6,418
5-10	12,490,576	81,747	10,443
10-20	1,506,940	19,702	3,592
20-50	414,989	12,037	3,353
50-100	60,260	3,994	1,646
100-500	15,153	2,153	1,227
500 & over	517	528	319
Total	44,159,622	210,372	29,431

Source: Estimates provided by courtesy of the National Bureau of Economic Research.

income group the more accurate will be our calculations albeit the more tedious the work involved. Actually, our choice is limited by the official tax returns which suffice to illustrate the method and yield statistically significant results. Table 1 contains the basic data for our calculations.

We may well suspect that errors in the tax returns will be mostly errors of omission and that, therefore, the tax that would have been collected by an omniscient government would be a larger proportion of the aggregate income than the proportion actually collected. Notwithstanding this source of discrepancy we may accept the table as a basis for calculation on the assumption that the percentage error between the "true" tax and the collected tax remains constant. Interested as we are in the relative changes of the aggregate tax and tax-income ratio, the significance of the discrepancy is slight.

The first step in deriving a relationship between aggregate income and aggregate income tax is to discover the relation between individual earnings and individual income tax,

$$(1) \quad t = \phi(y),$$

where  $t$  is the individual tax and  $y$  the individual income. Since the relevant circumstances of individual taxpayers vary widely we shall use the information in the table to estimate this relation for an *average* taxpayer and then subject all taxpayers to it. We assume that if, say, each of the number of taxpayers within a certain income group had his income increased by the same percentage thereby entering a higher-income group, the *average* tax now to be paid will be the same as that paid by the previous members of that income group, who have now likewise moved up in the income scale.<sup>4</sup>

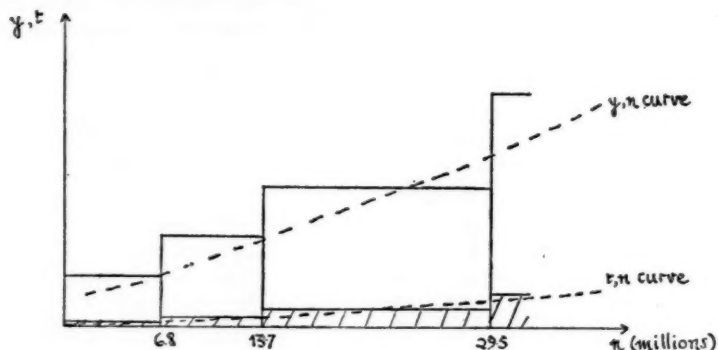


FIGURE 1

## LOGARITHMIC SCALES

Next we arrange the taxpaying groups from the smallest on the left to the largest on the right along the horizontal axis of Figure 1 which measures the number of taxpaying individuals  $n$ . Along the vertical axis we measure personal income,  $y$ , and income tax,  $t$ . For reasons of space we include only the three lowest-income groups. The shaded rectangles represent the tax paid by the group whose income is represented by the larger rectangle (average income *times* number of income-earners in group). On our definition, then, the existing tax-income ratio may be reckoned as the sum of the shaded rectangles over the sum of the outer rectangles, expressed as a percentage.

<sup>4</sup> Empirical justification for this assumption may be established by discovering identical average tax yields of equal income groups for two or more years a little apart in time, years in which the tax structure was the same or closely similar. Unfortunately, we have been unable to discover among the U.S. data two such comparable years, so that this assumption stands, at worst, along with the assumption of an equiproportional rise of income for each member of the earning population, as an approximation which we believe to be not so far removed from the true state of things as to impart, in a calculation of this kind, a significant bias to our results.

Suppose now that there is a rise in aggregate money income of 10 per cent. The height of each outer rectangle is raised by 10 per cent while the height of the corresponding tax rectangle is adjusted by reference to our tax-income function, equation (1) above. The area of the sum of the adjusted tax rectangles divided by the area representing the sum of the new income rectangles is the index of the new tax-income ratio.

Though this procedure is not impracticable and clearly illustrates the principle employed here, it would be wearisome to follow this procedure if we wished to measure the tax burden for varying rates of growth of aggregate income. In order therefore to devise a more general formulation we shall assume continuity in the range of incomes—which is not unreasonable considering the large numbers involved—and, in Figure 1, impose a continuous income-population curve and a continuous tax-population curve, indicated by the dotted  $y, n$  and  $t, n$  curves respectively, to replace the discontinuous curves traced out by the outer and inner rectangles. In fact we need derive statistically only the income-population curve,

$$(2) \quad y = f(n)$$

where  $n$  is the  $n$ th individual in the population so arranged. The tax-population curve follows directly from the simple transformation,

$$(3) \quad t = \phi[f(n)].$$

If now the  $y, n$  curve of Figure 1 were to shift upward in equal proportion along its entire length, the  $t, n$  curve would follow it upward at a determinate rate and, as we might guess, at a faster rate than the  $y, n$  curve. The response of the tax area to such an increase in the income area of our figure is, of course, the basic relationship that we seek,

$$(4) \quad T = \Psi(Y),$$

where  $T$  is the aggregate of personal income taxes and  $Y$  the aggregate of personal incomes of the community.<sup>5</sup>

<sup>5</sup> The mathematical derivation of (4) presents no difficulties. We have two equations to be estimated statistically, (1) and (2). From these two equations we can deduce (3). Initial aggregate income,  $Y_0$ , is equal to

$$\int_0^N f(n)dn,$$

where  $N$  is the entire population of income earners. Holding the population of income earners,  $N$ , constant, any aggregate income,  $Y$ , is equal to

$$\int_0^N \lambda f(n)dn,$$

If there is now a rate of growth of money income over time, say 100  $r$  per cent per annum, the magnitude of the aggregate money income after  $x$  years is  $Y_x$ , where

$$Y_x = Y_0(1 + r)^x.$$

Since for any  $Y_x$  we can now calculate the corresponding aggregate tax,  $T_x$ , from equation (4), the tax-income ratio  $T_x/Y_x$  is given by the ratio

$$\Psi[Y_0(1 + r)^x]/Y_0(1 + r)^x,$$

where  $Y_0$  is a datum,  $\Psi$  has been calculated, and  $r$  and  $x$  take on chosen values.

## II. A More Simplified Method

We have demonstrated a general method of calculating aggregate tax and the tax-income ratio corresponding to any size of aggregate money income for a tax-income function and an income-population function of any form, provided only that they are continuous and single valued. Though not difficult in principle it does entail the statistical estimation of these two functions and the derivation from them of a third function, (3). Unless the fit of the two statistical curves is unusually good the error in the third function may be disturbing.<sup>6</sup>

A great simplification of work and a reduction of error follow if the tax function is cast into the exponential form  $t = By^b$  for then we require neither the statistically derived income-population function, equation (2), nor the derived tax-population function, equation (3). Given only the initial aggregate income tax—and irrespective of the initial population, the initial aggregate income, or its distribution (provided only that the distribution remains unaltered during the income-changes)—a given percentage increase of that aggregate income associated with the initial aggregate tax in question will uniquely determine the increment in the aggregate tax.

This rather surprising proposition is made evident in the appendix, but it is also illustrated in Figure 2 in which the vertical axis measures

$\lambda$  being the ratio  $Y/Y_0$ . Finally, the aggregate income tax corresponding to any aggregate income is  $T$ , where

$$T = \int_0^N \phi[\lambda f(n)] dn.$$

And since  $N$  is held constant,  $T$  becomes a function of  $\lambda$ , or  $Y/Y_0$ .  $Y_0$  being constant,  $T$  becomes a function of  $Y$ , as in (4).

<sup>6</sup>To illustrate, in using this general method with the 1953 data we obtained very satisfactory fits for the two statistical functions. Notwithstanding this, the computed initial aggregate tax,

$$T_0 = \int_0^N \phi[f(n)] dn,$$

gave a figure some 10 per cent above that of the known aggregate tax of 1953.

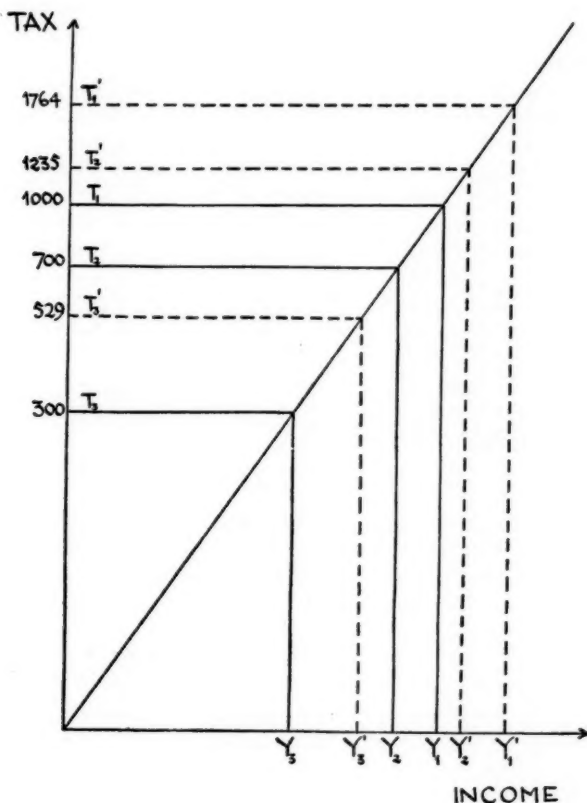


FIGURE 2

the logarithm of the tax and the horizontal axis the logarithm of the individual's income. The tax function,  $t = By^\beta$  appears therefore as a straight line in which  $\log B$  is the vertical intercept (not shown for convenience of presentation) and  $\beta$  the slope of the straight-line curve. For simplicity of exposition  $\log B$  is taken as equal to  $-2\frac{1}{2}$ , and  $\beta$  as equal to 1.4. As a matter of convenience, the axes passing through the origin are omitted in Figure 2, only the relevant part of the curve appearing.

We can now suppose two distinct communities, A and B, each paying the same aggregate income tax of 1,000, and each subjected to the

tax function in Figure 2. Community A contains only one individual who, consequently, pays the whole of the 1,000 tax which is represented by the height of  $T_1$  from the origin. The income corresponding to this tax is 8,483, and is represented by the distance from the origin to  $Y_1$ . In the other community there are two income-earners, one paying 700 and the other paying 300, these amounts being indicated by  $T_2$  and  $T_3$  respectively. Their corresponding incomes,  $Y_2$  and  $Y_3$ , are therefore 6,575 and 3,590 respectively. It should be noticed that aggregate income in B is larger than that in A, that population in B is larger than that in A, but aggregate tax, 1,000 is the same for both communities.

We now increase aggregate income in A and in B by 50 per cent. Since the increase is equiproportional, the new incomes will be 12,725, 9,863, and 5,385 for  $Y_1'$ ,  $Y_2'$ ,  $Y_3'$ , respectively, and the new taxes corresponding to them,  $T_1'$ ,  $T_2'$ , and  $T_3'$ , can be read from the curve in Figure 2, and will be 1,764, 1,235 and 529. The *increment* in tax in both communities is therefore 764, or 76.4 per cent.

### III. Estimates of Tax Yields

It is indeed fortunate that a tax function of the exponential form turns out to be such an excellent fit<sup>7</sup> for with the simplified aggregate tax function  $T_x = \lambda^B T_0$ , or, specifically using the 1953 data,  $T_x = \lambda^{1.42483} T_0$ , we may say simply that a change of the initial aggregate income by the ratio  $\lambda$  results in a change in the corresponding initial aggregate income tax by the ratio  $\lambda^{1.42483}$ . In other words a 1 per cent increase or decrease<sup>8</sup> of aggregate income is accompanied by, approximately, a 1.428 per cent increase or decrease in corresponding aggregate income tax, and a 10 per cent increase or decrease of aggregate income is accompanied by, approximately, a 14.54 per cent increase or decrease in corresponding aggregate income tax. With such a formula the cal-

<sup>7</sup> The specific individual tax function, equation (1), for 1953 turns out to be  $t = .0315y^{1.42483}$ , the coefficient of correlation being .9983.

<sup>8</sup> Pure deflation is, of course, symmetrical with pure inflation, and in such cases the formula is immediately applicable. On the other hand, a "recovery" or a "recession" characterized by sizable variation in employment violates the assumption that during the change in aggregate income the population remains constant. More important, however, it violates the assumption that the distribution of incomes remains unchanged when aggregate income varies. For example, during a recovery, newly employed individuals whose incomes come into the lowest tax brackets make a relatively small contribution to aggregate income tax. However, our assumption of an equiproportional spread of any increment of aggregate income over the pre-existing distribution of incomes issues in a greater tax yield than in fact is collected. Parallel reasoning for a recession reveals our assumption to issue in a reduction of income taxation which would be in excess of that experienced. Hence, in so far as a change in the level of prices is accompanied by changes in employment in the same direction, our method overstates the change in aggregate income taxation and to that extent exaggerates built-in stability.

TABLE 2.—AGGREGATE REAL PERSONAL INCOME TAXATION  
(billions of dollars)

Year	0 (1953)	1	2	3	5	10	15
Aggregate real personal income <sup>a</sup>	286	295	303	313	332	384	446
Virtual per annum yield <sup>b</sup> of aggregate real personal income tax at 1953 tax rates with per cent price-level increase per annum of:							
—10		32.3	32.2	32.1	32.0	31.6	31.2
— 5		33.1	33.8	34.4	35.9	39.7	44.0
— 3		33.4	34.4	35.4	37.5	43.4	50.2
0	32.4	33.8	35.8	36.8	40.0	49.4	61.0
1		33.9	35.6	37.2	40.9	51.5	65.0
2		34.1	35.9	37.7	41.7	53.7	69.2
3		34.2	36.2	38.2	42.6	56.0	73.6
5		34.5	36.7	39.1	44.4	60.8	83.2
10		35.2	38.2	41.5	49.0	74.0	111.9

<sup>a</sup> An increase of real income of 3 per cent p.a. is assumed throughout this table and all succeeding tables. Income includes transfer payments which in 1953 amounted to \$14.3 billion.

<sup>b</sup> We apply our aggregate tax function,  $T_x = \lambda^{1.42483} T_0$ , as estimated to the data given in the *Survey of Current Business*, July 1956.

Source: For 1953 data, *Survey of Current Business*, July 1956.

TABLE 3.—AGGREGATE REAL TAXATION  
(billions of dollars)

Year	0 (1953)	1	2	3	5	10	15
Aggregate real personal income <sup>a</sup>	286	295	303	313	332	384	446
Virtual per annum yield <sup>b</sup> of all taxes (in real terms) at 1953 tax rates with per cent price-level increase per annum of:							
—10		96.8	98.7	100.6	104.6	115.7	128.7
— 5		97.6	100.2	102.9	108.5	123.9	141.5
— 3		97.9	100.8	103.8	110.1	127.5	147.8
0	95.0	98.3	101.7	105.2	112.6	133.5	158.5
1		98.4	102.0	105.7	113.5	135.7	162.5
2		98.6	102.3	106.1	114.3	137.9	166.7
3		98.7	102.6	106.6	115.2	140.1	171.2
5		99.0	103.2	107.6	117.0	144.9	180.7
10		99.7	104.7	109.9	121.6	158.2	209.5

<sup>a</sup> As in Table 2.

<sup>b</sup> All taxes other than personal income taxes are assumed to increase in the same proportion as aggregate money income. (See text and footnote 10.)

Source: See Table 2.

TABLE 4.—ANNUAL TAX-INCOME RATIO (PERSONAL INCOME TAXES ONLY)  
(percentages)

Year	0 (1953)	1	2	3	5	10	15
Annual percentage price increase of:							
—10		11.0	10.6	10.3	9.7	8.2	7.0
— 5		11.2	11.1	11.0	10.8	10.3	9.9
— 3		11.3	11.3	11.3	11.3	11.3	11.3
0	11.3	11.5	11.6	11.8	12.1	12.9	13.7
1		11.5	11.7	11.9	12.3	13.4	14.6
2		11.6	11.8	12.1	12.6	14.0	15.5
3		11.6	11.9	12.2	12.9	14.6	16.5
5		11.7	12.1	12.5	13.4	15.8	18.7
10		12.0	12.6	13.3	14.8	19.3	25.1

Source: Table 2.

culatation of change in aggregate income tax, in real or money terms, for varying rates of productivity combined with varying rates of inflation or deflation becomes a relatively effortless operation.<sup>9</sup> Nevertheless, in order to convey an impression of the magnitudes involved we have made some estimates, which appear in Tables 2 to 5. Such estimates and any conclusions drawn from them will of course depend upon the particular characteristics of the tax structure in the United States during 1953.

In the tables we assume productivity to increase steadily over the future at 3 per cent per annum. Thus, as may be gathered from Table 2, it would require roughly a 3 per cent per annum decline in the price level to maintain aggregate money income unchanged over time. This, then, is the rate of deflation necessary if the *proportion* of income to be paid in as income tax is to remain constant (though, of course, *real* income tax being paid is increasing at the rate of 3 per cent per annum). If the price level does not alter over time, money income increases at the same rate as productivity—3 per cent per annum on our assumption—and the proportion of tax collected rises. In that

<sup>9</sup>In this connection it will be appreciated that our form of the exponential tax function,  $t = By^B$ , implies that tax is collected from all individual incomes no matter how small. The figures from which the function is derived are, we should remember, average figures. If, for example, the group averaging \$2,000 pay on the average a tax of \$10 per person, many in the group are in fact not paying any tax at all. Nonetheless, if, owing to an equiproportional rise in the incomes of the community, the old group is replaced by a new group with average incomes of \$2,000 we assume the same average tax of \$10 per person, though again a similar proportion of the group pays no tax at all. It is the averaging principle that enables us to include the lowest-income group in the tax function, and the imposition of continuity in the tax function that enables us to reach down to the lowest income in the community—a hypothetical zero income.

TABLE 5.—ANNUAL TAX-INCOME RATIO (ALL TAXES)  
(percentages)

Year	0 (1953)	1	2	3	5	10	15
Annual percentage price increase of:							
— 10		32.9	32.5	32.2	31.5	30.1	28.9
— 5		33.1	33.0	32.9	32.7	32.2	31.8
— 3		33.2	33.2	33.2	33.2	33.2	33.2
0	33.2	33.4	33.5	33.7	34.0	34.7	35.6
1		33.4	33.6	33.8	34.2	35.3	36.5
2		33.5	33.7	34.0	34.5	35.9	37.4
3		33.5	33.8	34.1	34.7	36.5	38.4
5		33.6	34.0	34.4	35.3	37.7	40.6
10		33.8	34.5	35.2	36.7	41.2	47.0

Source: Table 3.

case the aggregate money, and real, tax increases faster than 3 per cent per annum; in fact it begins to increase at about 4.3 per cent per annum. For a moderate inflation of, say, 3 per cent per annum, the initial per annum increase of real aggregate tax collected is in the region of 5.6 per cent. In 12 years or so, aggregate real tax would have doubled. It would double in a little over ten years if the price increase per annum averaged about 5 per cent.

A visual impression of Table 2 is given in Figure 3. Aggregate real income and aggregate real tax are measured vertically on a logarithmic scale whereas time, in years, is measured horizontally on a natural scale. The several lines beginning at  $T_0$  and sloping upward to the right trace the paths through time of per annum aggregate tax for different rates of inflation. For instance, the vertical line  $5-Y_5$  measures aggregate real income per annum 5 years from the base year. The intersection through it of, say, the 10 per cent line (at the point  $T$ ) provides the measure of per annum aggregate real tax,  $5-T$ , at the same point in time, the fifth year, when prices have been rising steadily at the rate of 10 per cent per annum.

It need hardly be said that this diagram could easily be modified to have the distance  $O-Y_0$  equal to the distance  $15-Y_{15}$ . Changes in real aggregate income and real aggregate tax could no longer be shown on such a diagram but the comparison of the tax-income ratio as defined would be immediately apparent. Though we have not included this modified diagram, the tax-income ratio figures for varying rates of inflation have been distilled from the information given in Table 2, and appear in Table 4. It may surprise some to observe that, with tax rates unchanged, it would require 15 years of inflation, averaging 10 per

## BILLIONS OF DOLLARS : LOGARITHMIC SCALE

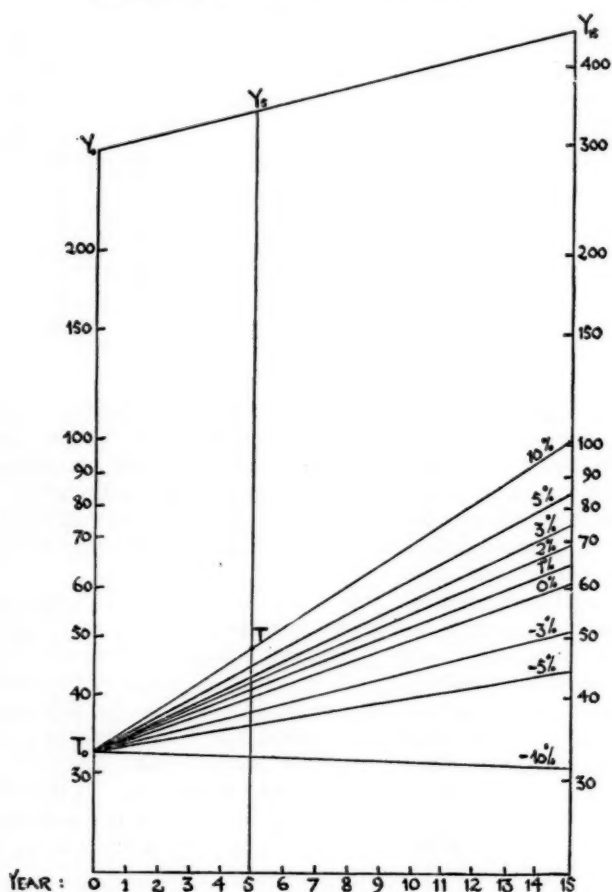


FIGURE 3

cent per annum, to raise the 1953 tax-income ratio of a little over 11 per cent to a tax-income ratio of just over 25 per cent per annum.

Finally, in order to impart some idea of the variations in total taxes we introduce a conjecture about the likely course of all taxes other than personal income taxes—the one already suggested, that they remain proportional to aggregate money income over time. The figure we use

is 21.9 per cent, the ratio of all other taxes to personal incomes in 1953.<sup>10</sup> Tables 3 and 5 give figures for total real tax and the total tax-income ratio respectively under the same conditions as those in Tables 2 and 4.

The tables afford an impression which makes detailed comment unnecessary. The tax-income ratio certainly increases with inflation but not as fast as might have been expected by those acquainted with the wonders that can be performed with compound interest.<sup>11</sup> Even with prices rising continuously at an average rate of 10 per cent per annum, 13 years or so are required before the burden of tax is doubled for the community as a whole, though for the higher ranges of income it will increase faster than this.

As for the disinflationary effect of a growth in aggregate real tax, it is plain that though this source of stability is not negligible economists who have put some emphasis on this factor<sup>12</sup> may find the magnitudes a little disappointing. Certainly we are impelled to the conclusion that a passive fiscal policy—maintaining tax rates constant with

<sup>10</sup> The ratio for the successive years, 1950-1955 inclusive, is 21.3, 22, 20.8, 21.9, 21, and 22.6 per cent. This assumption is not inconsistent with the regressive character of these other taxes taken together as a group as estimated by R. A. Musgrave [5, p. 198]. If each income bracket receives an equiproportional increase in income, in accordance with our assumption, then—provided the income distribution remains the same—aggregate income increases in the same proportion and so also does the amount of all other taxes when calculated as a proportion of income, notwithstanding that this proportion is larger for lower income brackets than it is for higher ones.

<sup>11</sup> Though fast enough to call into question the relevance of the arguments put forward by E. D. Domar [1]. Domar shows that, granted constant prices, a percentage growth of national income,  $r$  per annum, accompanied by continuous government borrowing at a percentage rate,  $\alpha$  per annum, will result in a growing debt burden which depends upon the rate of interest,  $i$ , paid on government bonds, and that this burden may be covered by a proportional tax (measured as total interest payments on the public debt divided by taxable income) which, though it grows over time, tends to a limit

$$\frac{i}{\frac{r}{\alpha} + i}.$$

Although this required tax rate turned out to be relatively low for any reasonable rate of government expenditure, the impression given of an additional burden to be met by taxes can be very misleading. Even with constant prices (or prices falling at an average rate of 3 per cent per annum) the government collects revenue at an ever-increasing rate and sufficient in magnitude to meet interest payments on any feasible rate of continuous government borrowing. While if only a limited rise in the level of prices over time is envisaged, a glance at Table 2 will suffice to assure the reader that the problem is hardly one of raising additional taxes but one of determining the disposal of growing revenues. If the government does not reduce taxes substantially and the level of prices does not fall continuously over the future—an unlikely contingency—either the government budget will tend to yield increasing surpluses or the government sector will tend to expand at the expense of the private sector of the economy.

<sup>12</sup> See, for instance, Milton Friedman's paper [2, esp. pp. 250-52].

unchanged (real) government outlays—would not by itself bring powerful pressure to bear on mild inflationary tendencies until after the lapse of quite a few years. Built-in stability is built small into the system, not large.

#### MATHEMATICAL APPENDIX

The object of this short analysis is to set out formally some of the preceding argument and to illustrate the methods of calculation used.

1. *The tax-income function and the distribution of incomes.* In the first instance we shall consider the most general case, assuming that the tax-income function and the distribution function of incomes may be described continuously. Thus:

$$(1) \quad t = \phi(y)$$

where  $t$  is the tax liability on the gross income  $y$ . And:

$$(2) \quad y = f(n)$$

where  $y$  is the gross income of the  $n$ th income-earner, ranked in order of magnitude of income.

Substituting for  $y$  in equation (1) gives:

$$(3) \quad t = \phi[f(n)].$$

2. *Aggregate tax and income.* If now all income-earners pay some tax,  $n$  may vary from 0 to  $N$  in both the tax and income functions.  $N$  is the total income-earning population. Thus aggregate taxation may be written:

$$(4) \quad T_0 = \int_0^N \phi[f(n)]dn$$

corresponding to an aggregate income of

$$(5) \quad Y_0 = \int_0^N f(n)dn.$$

3. *The effect of a rise in money incomes.* If now money incomes rise at a given rate and all incomes are affected alike we are able to measure the change in aggregate taxation, assuming that the tax-income function remains unchanged. Thus if a given  $y$  may now be written  $\lambda y$  where  $\lambda > 1$ , the tax liability on each of the new incomes becomes:

$$(6) \quad t = \phi(\lambda y)$$

and since the distribution of incomes remains unchanged,

$$(7) \quad t = \phi[\lambda f(n)].$$

Aggregate taxation now becomes:

$$(8) \quad T_\lambda = \int_0^N \phi[\lambda f(n)]dn$$

and the corresponding aggregate income is:

$$(9) \quad Y_\lambda = \int_0^N \lambda f(n) dn \\ = \lambda Y_0.$$

4. It has been assumed throughout that all income-earners pay some tax. If we consider the tax schedule in any detail this assumption appears too restrictive. But it should be remembered that we are concerned with a function relating *average* tax to *average* income. This function by its very continuity implies that tax is paid from the lowest to the highest income.

5. If the tax-income function takes the exponential form:

$$(10) \quad t = By^\beta$$

where  $\beta$  is the tax-income elasticity and is constant for all incomes, and  $B$  is some other constant, we can show that aggregate taxation is independent of the distribution of incomes.

Thus equations (4) and (8) may now be written:

$$(11) \quad T_0 = \int_0^N B[f(n)]^\beta dn$$

and

$$(12) \quad T_\lambda = \int_0^N B\lambda^\beta [f(n)]^\beta dn.$$

Subsequent taxation may therefore be expressed in terms of initial taxation as:

$$(13) \quad T_\lambda = \lambda^\beta T_0$$

which is independent of the distribution of incomes.

All that need be estimated by statistical methods is the average tax-income elasticity  $\beta$ .

6. *The effect of annual increases in prices and productivity.* If prices and productivity are assumed to rise at annual rates of 100*p* and 100*s* per cent respectively then from equation (13) the aggregate money tax after  $x$  years may be written as:

$$(14) \quad T_x = [(1 + p)(1 + s)]^{\beta x} T_0$$

where  $T_0$  is initial aggregate tax in year 0. Real aggregate tax becomes:

$$(15) \quad T'_x = [(1 + p)^{\beta-1}(1 + s)^\beta]^x \cdot T_0.$$

The aggregate tax-income ratio may be written as:

$$\frac{T_x}{Y_x} = \frac{[(1 + p)(1 + s)]^{\beta x} T_0}{[(1 + p)(1 + s)]^x Y_0}$$

where  $Y_0$  is initial aggregate income in year 0.

Therefore the aggregate tax-income ratio after  $x$  years becomes:

$$(16) \quad \frac{T_x}{Y_x} = [(1 + p)(1 + s)]^{(\beta-1)x} \cdot \frac{T_0}{Y_0}$$

7. *The statistical determination of  $\beta$ .* The coefficient  $\beta$  was determined by the method of least squares from the regression of  $\log t$  upon  $\log y$ . The average tax liabilities and incomes were calculated from Table 1 of the text. The variables were weighted according to the relative tax liability in each income group, because in estimating the tax-income function we can only approximate to some "ideal" function. There will be divergencies, in general, between observed and estimated taxes. Since we cannot attain the ideal we should, as it were, shift some of the inevitable error—the divergencies between estimated and observed values—away from the more important points on the function to the less important ones. If, to take an extreme example, 90 per cent of the aggregate tax were derived from the \$5,000 to \$10,000 group we should be concerned to achieve a closer correlation between observed and estimated values over this range even though, as a consequence, the functions will fit less well elsewhere.

The estimated equation in linear logarithmic form was:

$$\log t = -2.49801 + 1.42483 \log y \\ (0.12507) \quad (0.03121)$$

where the appropriate standard error of each estimated coefficient is given in brackets. The correlation coefficient for  $\log t$  and  $\log y$  was 0.9983 so that the fit can be considered to be a good one. For the purpose of all calculations  $\beta$  was taken as 1.42483.

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## THE SIZE DISTRIBUTION OF BUSINESS FIRMS

By HERBERT A. SIMON AND CHARLES P. BONINI\*

The distribution of business firms by size has received considerable attention from economists interested in the phenomena of competition and oligopoly and in the issues of government regulation to which these phenomena are relevant. That the size distribution of firms (whether within a single industry or in a whole economy) is almost always highly skewed, and that its upper tail resembles the Pareto distribution has often been observed, but has not been related very much to economic theory. Attempts at economic explanation of the observed facts about concentration of industry have almost always assumed that the basic causal mechanism was the shape of the long-run average cost curve; but there has been little discussion of why this mechanism should produce, even occasionally, the particular highly skewed distributions that are observed.

In Part I we shall discuss the adequacy of explanations of the size distribution based on the static cost curve. In Part II we shall propose an alternative theory based on a stochastic model of the growth process. In Part III we shall examine the empirical data in the light of the model. In Part IV we shall examine the implications of our analysis for public policy. In Part V we shall comment on some of the needs for empirical and theoretical research in this area.

### *I. Economic Theory of the Size of Firms*

Economic theory has little to say about the distribution of firm sizes. In general, we are led to expect a U-shaped long-run cost curve or planning curve for a firm. But the scale corresponding to minimum costs need not be the same for different firms, even in the same industry. If we employ the concept of economic rent, we can say that firms will have the same minimum cost, but varying outputs at this cost [8, pp. 123-127]. If this is the case, the cost curve yields no prediction about the distribution of firms by size and no explanation as to why the observed distributions approximate the Pareto distribution.

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Some theorizing has been concerned with long-run increasing, decreasing and constant cost curves for firms [10, esp. pp. 210-17]. But the theorizers have hesitated to draw conclusions about the observed size distributions. In some cases, the theory is indeterminate about the distribution, as in the case of constant costs [10, p. 211]. In others, the theorists point out that "industry" is such a vague and arbitrary term that comparing the sizes of different firms is like comparing oranges and apples. Differences in the size of markets for firms and the idea that firms are moving towards the equilibrium of the cost curve but haven't reached it are also mentioned as reasons why firms widely varying in size can survive in the same industry.

All these factors make static cost theory both irrelevant for understanding the size distributions of firms in the real world and empirically vacuous. And yet these distributions show such a regular and docile conformity to the Pareto distribution that we would expect some mechanism to be at work to account for the observed regularity.

In the previous discussion (as in much of the literature on this topic) our comments about the long-run cost curve have been completely a priori. Recently, J. S. Bain [2] has made a careful analysis of all the available information on the cost curves of firms and plants in a substantial number of industries, using both published and original data that he obtained by questionnaire. His data show that plant cost curves (ignoring the problem of intra-industry specialization) generally are J-shaped. Below some critical scale unit costs rise rapidly. Above the critical scale, costs vary only slightly with size of firm. Moreover, in only a very few industries (the typewriter industry is perhaps the most striking example) does the critical scale represent a substantial percentage of the total market. These facts correspond well with beliefs about these matters that are widely held by businessmen.

We can say, then, that the characteristic cost curve for the firm shows virtually constant returns to scale for sizes above some critical minimum— $S_m$ . Under these circumstances, the static analysis may predict the minimum size of firm in an industry with a known value of  $S_m$ , but it will not predict the size distribution of firms.

## II. Stochastic Models of Firm Size

In the context of a different theoretical framework, our limited knowledge of the shape of the long-run cost curve derived from static analysis might lead to much stronger predictions. This is, in fact, the case.

We postulate that size has no effect upon the expected percentage growth of a firm. We shall formalize this into the assumption (Gibrat's law of proportionate effect) that the distribution of percentage changes

in size, over a year, of the firms in a given size class is the same for all size classes. That is to say, we assume that a firm randomly selected from those with a billion dollars in assets has the same probability of growing, say, 20 per cent, as a firm randomly selected from those with a million dollars in assets.

There are two reasons why this is a plausible assumption on economic grounds. First, it agrees with the empirical findings, as we shall discuss more fully at a later point. Secondly, if, as we have postulated, there exists approximately constant returns to scale (above a critical minimum size of firm) it is natural to expect the firms in each size-class to have the same chance on the average of increasing or decreasing in size in proportion to their present size.

Before discussing the model in detail, we should like to comment on the numerous related models that have been proposed in recent years for explaining various skewed distributions of economic variables—including income [3], wealth [11], sizes of firms [7], and sizes of labor unions [6]. It has often been noted that many economic variates—and not only firm size—have frequency distributions with highly skewed upper tails. In the past, these distributions have been most often approximated by the log-normal distribution or the Pareto curve—sometimes with quite good fit.

Now many of the simple and commonly used statistical distributions can be generated from simple stochastic models—the normal distribution, the Poisson, the exponential, and so on. A stochastic process (e.g., the simplest random walk [4, pp. 279-307]) that will generate the normal distribution of a variate will, of course, when applied to the logarithm of the variate, generate the log-normal. But in applying the assumptions to the logarithm of the variate, we have, in effect, assumed the law of proportionate effect.

We can state the same point in a different way. If we incorporate the law of proportionate effect in the transition matrix of a stochastic process, then, for any reasonable range of assumptions, the resulting steady-state distribution of the process will be a highly skewed distribution, much like the skewed distributions that have been so often observed for economic variates. In fact, by introducing some simple variations into the assumptions of the stochastic model—but retaining the law of proportionate effect as a central feature of it—we can generate the log-normal distribution, the Pareto distribution, the Yule distribution, Fisher's log distribution, and others [9, pp. 425-27]—all bearing a family resemblance through their skewness. Contrariwise, we generally get quite different steady-state distributions from stochastic processes that do not embody the law of proportionate effect, or some approximation to it.

For the moment, we prefer to emphasize the generic similarities rather than the specific differences among the various stochastic processes that incorporate the law of proportionate effect. The log-normal and the Pareto distribution have been most often discussed in the literature; our own investigations, and Champernowne's, have led more often to the class of distributions we have called the Yule distribution.

Let us assume that there is a minimum size,  $S_m$ , of firm in an industry. Let us assume that for firms above this size, unit costs are constant. Individual firms in the industry will grow (or shrink) at varying rates, depending on such factors as (a) profit, (b) dividend policy, (c) new investment, and (d) mergers. These factors, in turn, may depend on the efficiency of the individual firm, exclusive access to particular factors of production, consumer brand preference, the growth or decline of the particular industry products in which it specializes, and numerous other conditions. The operation of all these forces will generate a probability distribution for the changes in size of firms of a given size. Our first basic assumption (the law of proportionate effect) is that this probability distribution is the same for all size classes of firms that are well above  $S_m$ . Our second basic assumption is that new firms are being "born" in the smallest-size class at a relatively constant rate.

It has been shown elsewhere that under these assumptions the Yule distribution will be the steady-state distribution of the process [9, pp. 427-30]. Let  $f(s)ds$  be the probability density of firms of size  $s$ . Then the Yule distribution is given by:

$$(1) \quad f(s) = KB(s, \rho + 1),$$

where  $B(s, \rho + 1)$  is the Beta function of  $s$  and  $(\rho + 1)$ ,  $K$  is a normalizing constant, and  $\rho$  is a parameter. It is easy to show that as  $s \rightarrow \infty$ ,

$$(2) \quad f(s) \rightarrow Ms^{-(\rho+1)},$$

which is the Pareto distribution. Hence the Pareto distribution approximates the Yule distribution in the upper tail.

The details of the derivation of the Yule distribution need not be repeated here [9, pp. 427-35]. What distinguishes the Yule distribution from the log-normal is not the first assumption—the law of proportionate effect—but the second—the assumption of a constant "birth rate" for new firms.<sup>1</sup> If we assume a random walk of the firms already in the system at the beginning of the time interval under consideration, with zero mean change in size, we obtain the log-normal. If we assume

<sup>1</sup> The otherwise excellent study by Aitchison and Brown [1, p. 109] is in error in supposing that Champernowne's model of income distribution would have yielded the log-normal instead of the Yule distribution if Champernowne had taken a continuous rather than a discrete model. The real difference between the models lies in the assumptions about boundary conditions.

a random walk, but with a steady introduction of new firms<sup>2</sup> from below, we obtain the Yule distribution.

The parameter,  $\rho$ , of the Yule distribution has a simple interpretation. Let  $G$  be the net growth of assets of all firms in an industry during some period, and let  $g$  be that part of the net growth attributable to new firms—firms that have reached the minimum size during the period. Then, it can be shown that:

$$(3) \quad \rho = \frac{1}{1 - g/G} = \frac{1}{1 - \alpha}, \quad \text{where } \alpha = g/G.$$

Thus, if  $g/G = .10$ —new firms account for 10 per cent of the growth in assets in the industry—we will have  $\rho = 1/(1 - .1) = 1.11$ . In the limit, as the contribution of new firms to total growth approaches zero,  $\rho$  approaches 1. Although it is assumed in the derivation that  $\alpha$  be a constant, a slow change in  $\alpha$  can be expected to modify the steady-state distribution only slightly.

### III. The Empirical Data

Since published empirical data on the distributions of firms by size are numerous and monotonously similar, we will limit ourselves to some illustrative figures. Whether sales, assets, numbers of employees, value added, or profits are used as the size measure, the observed distributions always belong to the class of highly skewed distributions that include the log-normal and the Yule. This is true of the data for individual industries and for all industries taken together. It holds for sizes of plants as well as of firms.<sup>3</sup>

The log-normal function has most often been fitted to the data, and generally fits quite well. It has usually been noticed, however, that the observed frequencies exceed the theoretical in the upper tail, and that the Pareto distribution fits better than the log-normal in that region. This observation suggests that the stochastic mechanism proposed in the previous section is the appropriate one, and that the data should be fitted with the Yule distribution.

We have fitted straight lines to the logarithms of the cumulative distributions for the British data of Hart and Prais, and for the data on large American firms in 1955 published in *Fortune* [5], obtaining

<sup>2</sup> They need not be new-born, merely small. That is, we may assume some arbitrary lower size limit and regard any firm that reaches this size as "new-born." In this case the equilibrium distribution will hold only for firms above the minimum.

<sup>3</sup> It is the ubiquitousness of these functions in size distributions of firms, as well as in distributions of wealth, incomes, city populations and a host of other, more or less unrelated, phenomena that argues most persuasively for their common base in some kind of weak probabilistic hypothesis.

good fits in both cases.<sup>4</sup> In the British case, we get  $\rho = 1.11$ , in the American  $\rho = 1.23$ . On the basis of these parameters, we would infer that a little less than one-fifth (18.7 per cent) of the growth in assets of the American firms was accounted for by new firms, and about one-tenth (9.9 per cent) in the British case.

It is not necessary, of course, to make indirect inferences of this sort from the steady-state distributions. Data are now available, both in Britain and the United States, that allow us to follow the changes in size of individual firms, and to construct the transition matrices from one time period to another. Hart and Prais have published such transition matrices for British business units for the periods 1885-96, 1896-1907, 1907-24, 1924-39, and 1939-50 [7, Tables 3, 4, 5, 6, 7]. From the matrices, they have been able to test directly the first assumption underlying the stochastic processes we are considering—the law of proportionate effect. They found that the frequency distributions of percentage changes in size of small, medium, and large firms, respectively, were quite similar—approximating to normal distributions with the same means and standard deviations. We found the same to be the case with the transition matrix for the 500 largest U. S. industrial corporations from 1954 to 1955 and 1954 to 1956.

A simple, direct way to test the law of proportionate effect is to construct on a logarithmic scale the scatter diagram of firm sizes for the beginning and end of the time interval in question. If the regression line has a slope of 45 degrees and if the plot is homoscedastic, the law of proportionate effect holds and the first assumption underlying the stochastic models holds. A plot of the U. S. data shows these conditions to be well satisfied for the 1955-56 period.

In addition, as an independent check of our parameter  $\rho$ , we calculated for the American firms for the years 1954-56 the quantities  $G$  (net growth in assets—for all firms above the \$200 million category) and  $g$  (the part of this growth due to new firms—those entering the \$200 million group). The figure obtained for  $g/G$  was 21.2 per cent which yields a  $\rho$  of 1.27. These may be compared with the respective indirect estimates, 18.7 per cent and  $\rho = 1.23$ , above. Thus we have obtained a close correspondence between the parameter obtained by fitting a steady-state distribution and that obtained by studying the growth of firms over time.

Thus far our data have encompassed an entire economy rather than a single industry. We justify applying the process to the whole economy on several grounds. First, the stochastic growth model we have de-

<sup>4</sup> In the absence of better developed theories about goodness of fit of these skew distributions than we now have, we prefer not to make definite statements about "how good" the fits are.

scribed makes no reference to any feature of the cost curve, other than that costs are constant above some minimum point. Nothing in the model requires the firms in the sample to have the same cost curves. Second, if firms in various industries are distributed according to the Pareto curve with slopes close to 1 in each case, the composite curve for all industries will be a Pareto curve with slope close to 1. For these reasons, the arbitrariness of industry classification, and the heterogeneity of firms within industries do not create the same difficulties in applying the present theory as in applying classical cost theory to explain size distributions.

As an example of a distribution for a single industry, and because it represents an intrinsically interesting case in view of recent discussions

TABLE 1.—INGOT CAPACITIES OF TEN LEADING STEEL PRODUCERS  
(Millions of Net Tons per Year, based on Capacity as of January 1, 1954)

Producer	Capacity	
	Actual*	Estimated
U. S. Steel	38.7	34.3
Bethlehem	18.5	17.1
Republic	10.3	11.3
Jones & Laughlin	6.2	8.5
National	6.0	6.8
Youngstown	5.5	5.2
Armco	4.9	4.8
Inland	4.7	4.2
Colorado Fuel & Iron	2.5	3.8
Wheeling	2.1	3.4
Total, 10 Companies	99.4	99.4

\* Source: Actual from *Iron Age*, January 5, 1956, p. 289.

of mergers, we present in Table 1 a comparison of the actual ingot capacities of the ten leading steel producers with the theoretical capacities computed from the Yule distribution, with  $\rho$  taken at its limiting value, 1.

Perhaps the most interesting question for single industries is whether we can find any evidence of the minimum economic scale,  $S_m$ , from the size distributions. However, it is much more difficult to establish the minimum feasible size of firm than to establish the minimum feasible size of plant. The latter can often be estimated reasonably from engineering design considerations, and Bain found in most industries some consensus about this minimum scale for an efficient plant [2, Appendix B]. There is much less basis for estimating, and much less consensus about, the minimum scale for an efficient firm.

TABLE 2.—ESTIMATE OF MINIMUM FEASIBLE PLANT SIZE\*

Industry	Bain Estimate as Per Cent of National Market	Estimate from Census Data by Yule Distribu- tion as Per Cent of Total Value Added by Manufacture
Flour and milling	0.05 to 0.25	0.07 to 0.19
Footwear	no minimum	0.03 to 0.07
Canned fruits and vegetables	no minimum	0.06 to 0.11
Cement	0.4 to 0.7	0.14 to 0.54
Distilled liquors (except Brandy)	0.2 to 0.3	0.03 to 0.11
Petroleum refining	0.4 to 0.9	0.12 to 0.34
Meat packing	no minimum	0.3 to 0.7
Rubber tires and tubes	0.35 to 0.7	1.6 to 5.5
Rayon	1.0 to 3.0	0.14 to 0.37
Soap and glycerin	0.2 to 0.3	0.03 to 0.11
Cigarettes	1.0 or less	0.08 to 2.0
Fountain pens and mechanical pencils	1.3 to 2.5	0.06 to 0.16
Typewriters	5.0	5.7 to 14.1

\* Minimum feasible plant size is that below which costs per unit rise substantially. The industries listed are those used by Bain, with seven omitted because of the inadequacy or incomparability of the data.

Sources: The Bain estimates were computed by multiplying his estimates of minimum efficient plant size [2, Table III, p. 72] by the fraction of their size that was encountered before costs rose substantially [2, Appendix B].

The estimates from Census Data were computed by plotting the cumulative number of firms from the 1947 *Census of Manufacturers* against size in number of employees for the industries listed. Sharp breaks in the cumulative plot from a slope of  $-1$  were taken as estimation points for the minimum feasible plant size and were converted to a percentage of total value added by manufacture from the same Census tables.

Taking Bain's estimates of the minimum efficient plant size, on the one hand, and Census of Manufacturers data on the size distribution of plants, on the other, we have made some preliminary attempts to compare for several industries the minimum efficient scales suggested by these two sets of data. The results are listed in Table 2. Our procedure was this: If there is a sharp increase in unit costs below some critical size,  $P_m$ , the number of plants in the industry below that size should be less than the number predicted from the Yule process. We plot cumulative numbers of plants against size on log paper, and look for sharp bends from a slope approximating  $-1$  to a lower slope.

We have used census data for numbers of employees and converted these to per cent of total value added by manufacture. Our measure is thus comparable to Bain's which is based upon the percentage that a plant represents of total national market.

The reader can draw his own conclusions as to how far the two estimating procedures lead to similar results. Since we have made no more than preliminary explorations, we do not wish to push the point too

hard. It is clear, however, that the stochastic model provides some novel ways of interpreting the data on size distributions that may cast considerable light on the question of economies of scale. The argument runs as follows: If we take the stochastic model seriously, then any substantial deviation of the results from those predicted from the model is a reflection of some departure from the law of proportionate effect or from one of the other assumptions of the model. Having observed such a departure, we can then try to provide for it a reasonable economic interpretation.

In concluding this discussion of the data, we should like to emphasize a point made earlier—that the transition matrices may provide an even more valuable source of data about the process determining the sizes of firms and plants than the size distributions themselves. Since most of the empirical work to date has focused on the latter rather than the former, the reversal of emphasis initiated by the work of Champernowne, Hart and Prais, and others, is a very promising one.

#### *IV. Implications for Economic Policy*

In discussions of the degree of competition in individual industries, various measures of degree of concentration have been used. Few of these have other than an empirical basis, and the values that are obtained depend, in ways that are only partly understood, on methods of classification, cut-off points, and the like. Among the frequently used measures are Lorenz's and Gini's coefficients of concentration.

As Aitchison and Brown [1, pp. 111-16] argue, if we fit a distribution function to the observed data on the basis of a theoretical model, it is reasonable to base our measures of concentration on the parameters of the distribution function. Thus, they propose the standard deviation of the log-normal as an appropriate measure of dispersion, and show that the Lorenz and Gini coefficients can be expressed as functions of that statistic.

Similarly, if we use the Yule process to account for the distribution of firm sizes, our interpretation of the observed phenomena should be based on the estimated values of the parameters of the distribution. In the simplest case, the only one we have considered here, there is a single parameter,  $\rho$ . We have already provided an economic interpretation for this parameter in the previous section—it measures, in a certain sense, the rate of new entry into the industry. Hence, in this particular model, the concentration in an industry is not independently determined, but is a function of rate of new entry.

We may put the matter more generally. If firm sizes are determined by a stochastic process, then the appropriate way to think about public policy in this area is to consider the means by which the stochastic

process can be altered, and the consequences of employing these means. As a very simple example, if the rate of entry into the industry can be increased, this will automatically reduce the degree of concentration, as measured by the usual indices. Similarly, if, through tax policies or other means, a situation of sharply increasing costs is created in an industry, this situation should cause a departure of the equilibrium distribution from the Yule distribution in the direction of lower concentration.

A third, and more complicated, example is this: the amount of "mixing" that takes place—reordering of the ranks of firms in an industry—depends on the dispersion of the columns of the transition matrix. The same equilibrium distribution may be produced with various degrees of mixing, since the latter can vary independently of the law of proportionate effect. Public policy might be concerned with the amount of mobility rather than with the resulting degree of concentration. As a matter of fact, a measure of mobility (for firms or individuals) would appear to provide a better index of what we mean by "equality of opportunity" than do the usual measures of concentration.

The net effect of approaching the subject of industrial concentration in this way will be to make the classical theory of the firm much less relevant to the subject, but theories of economic development and growth much more relevant. When we have a collection of adaptive organisms placed in a relatively stable environment, we can often make strong predictions about the resulting state of affairs by assuming that the system will come into a position of stable, adaptive equilibrium. When, however, the environment itself is changing at a rate that is large compared with the adaptive speeds of the organisms, we can never expect to observe the system in the neighborhood of equilibrium, and we must invoke some substitute for the static equilibrium if we wish to predict behavior. Our main objective in this paper is to suggest the need for, and the availability of such a substitute with which to analyze the size distribution of firms.

#### V. *Directions for Research*

We have emphasized the tentative character of our results, and should like to suggest in conclusion some directions of research that look exceedingly promising:

1. We need to accumulate a body of knowledge about skew distribution functions and the processes that generate them that is comparable to the rich knowledge we possess about the normal, Poisson, exponential, and related distributions. We need to know more about the relations between the distributions and the generating processes, about efficient methods for estimating parameters, about the distributions of these

estimates, and about efficient methods for choosing among alternative hypotheses.

2. We need to develop stochastic models of economic growth that embody as much knowledge as we have, or can acquire, about the underlying processes.

3. We need to re-examine the corpus of economic data to see what part of it can profitably be explained or reinterpreted in terms of such economic models.

4. We need to re-examine those principles of public policy that are based on static equilibrium analysis to see what part of them will remain and what part will be altered as stochastic processes begin to play a larger role in our explanation of economic phenomena.

In this paper we have tried to suggest some of the directions in which inquiry may lead if it is guided by questions such as these.

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## A SKEPTICAL NOTE ON THE CONSTANCY OF RELATIVE SHARES

By ROBERT M. SOLOW\*

Ever since the investigations of Bowley and Douglas it has been widely believed that the share of the national income accruing to labor is one of the great constants of nature, like the velocity of light or the incest taboo. Keynes [12, p. 48] called it "a bit of a miracle." Even if it is sometimes observed that the pattern of distributive shares shows long-run shifts or short-run fluctuations, the former can be explained away and the latter neglected on principle. The residual belief remains that, apart from a slight (and questionable) upward trend and a countercyclical movement, the share of wages in the privately produced national income is unexpectedly stable. Much effort is devoted to exploiting and explaining this fact.

The object of this paper is to suggest that, like most miracles, this one may be an optical illusion. It is not clear what exactly is meant by the phrase: "The wage share in national income is relatively stable" or "historically almost constant." The literature does not abound in precise definitions, but obviously literal constancy is not in question. In any case, what I want to show is that for one internally consistent definition of "relatively stable," the wage share in the United States for the period 1929-1954 (or perhaps longer) has not been relatively stable.

If this contention is accepted, it is not without some general implications for economic theory. Beginning with Ricardo there have been sporadic revivals of interest in macroeconomic theories of distribution.<sup>1</sup> Now it is possible to have an aggregative distribution theory without believing in the historical constancy of relative shares, but the belief certainly reinforces the desire for such a theory. After all, a powerful macroeconomic fact seems to call for a macroeconomic explanation. It need not have one, but that is beside the point. As Kaldor says [9, p. 84]:

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<sup>1</sup>I suppose the main contributors since Paul Douglas [4] have been M. Kalecki in [10] and, more recently [11, Ch. 2]; K. Boulding [2, Ch. 14]; N. Kaldor [9]; Kaldor's main argument was anticipated five years earlier by F. H. Hahn [6].

... no hypothesis as regards the forces determining distributive shares could be intellectually satisfying unless it succeeds in accounting for the relative stability of these shares in the advanced capitalist economies over the last 100 years or so, despite the phenomenal changes in the techniques of production, in the accumulation of capital relative to labor and in real income per head.

But if, in fact, relative stability of distributive shares is at least partially a mirage, one may feel freer to seek intellectual satisfaction elsewhere. There is still a lot to be explained.

### *I. How to be Constant though Variable*

Table 1 shows the share of compensation of employees in a number of different aggregate income totals, so that the reader can see what kind of variability occurs, over the business cycle and over longer periods.

What does an economist mean when he says that the wage share has been relatively stable? Since he does not mean that it has been absolutely constant, he must mean that in some sense or other it has been more nearly constant than one would ordinarily expect.<sup>2</sup> The sentence already quoted from Kaldor suggests that since technique, real capital and real income per head have all changed "phenomenally," you would normally expect distributive shares to have changed "a lot," but they have only changed "a little" and this requires a special explanation. Not to split verbal hairs, it is evident that this is no definition at all. One must have some standard by which to judge whether some particular series of observations has fluctuated widely or narrowly.

Such standards of comparison can arise in a variety of ways. A tight theory may itself provide a benchmark. For example, the fraction of males among live births in a well-defined animal population is subject to statistical fluctuations from year to year. But the theory of sex determination, although perhaps not complete, gives some indication of how variable one ought normally expect the series to be. To say that the series is relatively stable could then simply mean that the observed variance is significantly less than the variance expected from the theory. Something like this does appear to be in the back of some authors' minds when they refer to the stability of the wage share. Take as a starting-point the neoclassical general equilibrium theory of distribution, which is formulated in terms of production functions, input-ratios, and the like. These quantities fluctuate over time. Ought not the pattern of distributive shares show comparable variability, according to the theory?

<sup>2</sup> A sporting colleague of mine once offered to bet that Vincent Impellitteri would get more votes for Mayor of New York City than most people expected.

TABLE 1.—SHARE OF COMPENSATION OF EMPLOYEES IN VARIOUS INCOME TOTALS, 1929-1955

Year	As Per Cent of National Income	As Per Cent of Privately Produced Income	As Per Cent of Income Originating in Corporate Business	As Per Cent of Income Originating in Manufacturing
1929	58.2	55.6	74.6	74.2
1930	61.8	57.3	78.7	76.7
1931	66.5	63.2	87.9	88.0
1932	73.2	69.3	101.0	108.0
1933	73.4	69.5	101.6	104.7
1934	70.0	69.6	88.3	89.4
1935	65.3	60.8	83.8	82.6
1936	66.1	61.3	80.0	78.3
1937	65.1	61.0	79.9	78.7
1938	66.6	61.8	83.0	83.3
1939	66.1	61.6	80.9	79.9
1940	63.8	59.5	76.2	73.4
1941	61.9	57.6	72.7	69.0
1942	61.9	56.8	71.7	71.1
1943	64.4	57.6	72.2	73.4
1944	66.4	58.8	73.8	74.8
1945	68.0	59.8	77.0	77.3
1946	65.5	60.6	79.9	78.8
1947	65.3	61.7	77.5	75.9
1948	63.6	60.0	74.8	72.9
1949	65.2	61.2	75.7	73.5
1950	64.3	60.4	73.6	70.8
1951	65.1	60.8	74.0	71.1
1952	67.2	62.8	76.7	75.4
1953	68.9	64.5	78.5	77.5
1954	64.4	65.0	79.6	79.3
1955	68.9	64.7	77.4	76.5

Source: Department of Commerce, *Surv. Curr. Bus.*, *National Income Supplement*, 1954, and July 1956.

But there is a world of difference between this case and the genetic illustration. The general equilibrium theory is in the first instance a microeconomic one. Between production functions and factor-ratios on the one hand, and aggregate distributive shares on the other lies a whole string of intermediate variables: elasticities of substitution, commodity-demand and factor-supply conditions, markets of different degrees of competitiveness and monopoly, far-from-neutral taxes. It is hard to believe that the theory offers any grip at all on the variability of relative shares as the data change—in fact this may be viewed by some as a symptom of its emptiness. A license to speculate, maybe, but hardly a firm standard. As a matter of speculation, the theory might be taken to imply that the aggregate shares come about through a kind of averaging process, in which many approximately independently changing

parameters intervene. From this view would follow an expectation of "relative stability," if anything.

A second possible source of a standard of variability is suggested by the analogy of statistical quality control. There the problem is also one of detecting "excessive" variability (or sometimes even deficient variability). But in the absence of some outside specification, the standard is usually given by the past behavior of the process itself. Clearly if the wage share had once oscillated between 50 and 80 per cent and now moved only in the range from 60 to 70 per cent, we could speak of relative stability. But it is not claimed that this is the case.

Third, the contrast between micro- and macroeconomic theories suggests that it might be possible to formulate an *internal* standard of variability. A hint in that direction is contained in a remark of Phelps-Brown and Hart [14]: "Yet it still remains true that the changes in the share of wages in national incomes are not so great as we should expect when we look at the often wide swings of the corresponding shares within particular industries, and this relative stability also calls for explanation." Indeed it does; if the calorie contents of breakfast, lunch, and supper each varies widely, while the 24-hour total remains constant, we at once suspect a master hand at the controls. Similarly if wide swings within industries yield only narrow swings in the aggregate, this points to some specifically interindustrial or macroeconomic force.

But relative shares have denominators as well as numerators. However we subdivide the economy, the over-all share will be a weighted average, not a sum, of the respective shares for the subdivisions. This does not automatically entail that the over-all share will have a smaller variance than the sector shares. That all depends on the intersector correlations, i.e., on the macroeconomic forces. Note an interesting consequence: it is *negative* correlations between sectors which reduce the variance of the weighted average.

Here we have something empirically testable. Suppose, to take the simplest possible case, the economy is divided into  $k$  equal-sized sectors, in each of which the wage share is equally variable through time. Then if the sector shares fluctuate independently, the aggregate wage share will have a variance only  $1/k$  times the common sector variance. If this were in fact the picture, it would be hard to claim that the relative stability of the aggregate shares required a specifically macroeconomic explanation. It might still be claimed that the aggregate share is more stable than it ought to be on this hypothesis, but now the explanation would have to be sought in the excessive stability of the individual sector shares. I suppose it could be plausibly argued that there are macroeconomic reasons for such microeconomic stability, but this is not the form that current theories take.

The more general case is no more complicated. Suppose there are  $k$  sectors, with shares  $S_1, \dots, S_k$  and weights in the aggregate  $w_1, \dots, w_k$ . If the  $S_i$  represent the share of wages in the sector value-added, the  $w_i$  will represent the share of the sector value-added in the total. Let  $\sigma_i^2$  be the variance of  $S_i$  through time, and let symbols without subscripts represent the aggregate share and its variance. Then in the null case of independence among sectors we would find:

$$(1) \quad \sigma^2 = \sum_1^k w_i^2 \sigma_i^2,$$

and in any case we would have

$$(2) \quad S = \sum_1^k w_i S_i.$$

Predominantly positive correlations among sectors will yield a larger  $\sigma^2$  and negative correlations a smaller  $\sigma^2$ .

The value-added weights, however, are not constant from year to year. And on the face of it changes in the weights might be expected to be the main intersectoral force accounting for the relative stability of the aggregate share. If in fact the aggregate share fluctuated less than the sector shares would suggest, this might come about through countershifts in the weights: low-share sectors gaining in weight at the expense of high-share sectors when sector shares rise, and vice versa. There are good theoretical reasons why this might occur, but the fact is that it does not.

This subsidiary proposition is easy testable. It is only necessary to recompute the over-all shares using the observed sector shares but some fixed set of base-year weights. This has been done by Kalecki [11, p. 32] for U. S. manufacturing, 1879-1937, and by Edward F. Denison [3, p. 258] for the "ordinary business sector," 1929-1952. In both cases the fixed-weight series showed approximately the same amplitude of fluctuation as the observed series. The same conclusion can be read from the data to be analyzed below. Short- and long-run changes in the importance of the various sectors are important economic facts,<sup>3</sup> but they are not what accounts for the variance or lack of variance of the over-all shares. Thus in making use of formulas 1 and 2 I have in each case recalculated the averages using the value-added weights of a fixed base-year, usually somewhere in the middle of the period.

<sup>3</sup> James W. Beck [1] explicitly investigates short-run changes in over-all shares during the three periods 1930-32, 1941-43, 1950-53. Only in the second of these were weight-shifts a predominant factor. One wonders whether commodity substitution would not prove to be more important in a finer industry classification. John Dunlop, in his pioneering study [5, esp. pp. 163-91], also found weight-shifts to be a significant factor for the period 1929-34.

## II. Empirical Results

The sector shares in Table 2 were calculated from the 1954 *National Income Supplement to the Survey of Current Business* (pp. 176-79). In each case they represent the ratio of "compensation of employees" to "national income originating."<sup>4</sup> The original data are reported for eleven sectors, not the seven used here. The four disappearing sectors are: Rest of the World; Government; Finance, Insurance, and Real Estate; and Services. The Rest of the World is a horse of a wholly different color. Government had to be dropped because our quaint

TABLE 2.—SHARE OF COMPENSATION OF EMPLOYEES IN INCOME ORIGINATING IN SELECTED SECTORS OF THE ECONOMY FOR SELECTED YEARS, 1929-1953

Sector	Weight	1929	1935	1937	1939	1941	1947	1951	1953	Variance
Agriculture, etc.	.113	.170	.134	.153	.185	.162	.170	.162	.206	.0004
Mining	.031	.751	.813	.715	.761	.705	.733	.704	.740	.0013
Contract Construction	.056	.667	.709	.704	.710	.733	.727	.759	.766	.0010
Manufacturing	.441	.742	.826	.787	.799	.690	.759	.711	.711	.0021
Wholesale and Retail Trade	.230	.702	.726	.691	.701	.624	.633	.650	.670	.0013
Transportation	.084	.725	.800	.812	.785	.717	.840	.805	.815	.0018
Communications and Public Utilities	.044	.541	.540	.560	.550	.543	.697	.619	.604	.0030
Total (Current Weights)		.647	.658	.656	.675	.613	.653	.631	.696	.0007
Fixed-Weight Total		.652	.702	.677	.688	.613	.666	.642	.678	.0008

accounting practices measure the value of its product by the compensation of its employees, so that by assumption no income is ever imputed to government-owned capital assets. I dropped the other two noncommodity-producing sectors on the grounds that the value-added concept is rather vague for them, and in many cases probably bears no remotely technological relation to conventional inputs. One could make a similar (but weaker) case for not including Trade, and one could argue that the imputation to wages in Agriculture may depend heavily on shifts between family and hired labor; but I have kept both in an effort to widen the coverage. The sector shares are shown for a selection of eight years between 1929 and 1953 but not for all. This was a perhaps unwise attempt to avoid the deep depression years and the war period.

<sup>4</sup> National income originating is a slightly more net concept than value added, since it excludes depreciation charges, indirect business taxes, and business transfers. Compensation of employees is the sum of wages, salaries, and the usual supplements. The figures no doubt exclude certain payments which logically ought to be imputed to labor, particularly part of the earnings of unincorporated enterprise. Cf. [3, p. 256] Probably the salary data also catch certain payments which function more like profits. I doubt that these "errors of observation" can influence the broad results substantially.

The table shows both the current-weighted over-all labor share and a fixed-weight series using the weights of 1941. In only one year does the use of fixed weights result in a change in the aggregate share of more than 2 percentage points, and the variability, as measured by the variance, is affected hardly at all. In part this is because the weights do not change radically, the main shift being a decrease in the relative weights of Agriculture and Transportation between 1929 and 1953, with Manufacturing gaining.

The last column shows the variance of each sector share and of the two aggregate-share series. The fixed-weight aggregate has a variance of .0008. If formula 1 is used to calculate a theoretical variance on the assumption that the sector shares moved independently in a statistical sense, it turns out to be .0005. This difference is almost certainly not statistically significant. We would have to conclude that the aggregate share varied just about as much as it would vary if the individual sector shares fluctuated independently, with positive and negative intercorrelations approximately offsetting each other. If anything, the aggregate share fluctuated a bit *more* than the hypothesis of independence would indicate. Anyone who believes that the aggregate share over this period was unexpectedly stable must believe the same of the sector shares and presumably seek the explanation there.

In Table 3, data from the Census of Manufacturing are analyzed in the same way. With the exception of 1941 and the substitution of 1954 for 1953, the same years are represented. Now the ratios give the share of wages only ("production workers' wages") in value added.<sup>5</sup> The fixed-weight average is calculated with weights equal to the 1947 fraction of each industry group in the aggregate value added. Once again the use of fixed weights makes only a negligible difference. In no year do the shares with fixed and current weights differ by as much as 1 per cent. The seven-year variance of the observed aggregate shares is .00028, and for the fixed-weight aggregate it is slightly increased to .00036.

But there is a striking difference between the behavior of the Manufacturing data and the wider Commerce figures. When a theoretical variance is calculated from formula 1, i.e., on the assumption that industry shares are statistically independent, it turns out to be only .00007. This is one-quarter of the observed share variance and one-fifth of the variance of the fixed-weight over-all share. And this substantial difference is in the "wrong" direction. The share of wages in manufacturing value-added fluctuates noticeably *more* than it would if the

<sup>5</sup> There are plenty of anomalies as between Table 2 and Table 3. Presumably they reflect the differences in concept between Census and Commerce data, as well as sheer observational error.

industry shares were mutually uncorrelated. This implies that there is predominantly positive intercorrelation among the wage shares in the separate industries. Instead of a special explanation of the relative stability of the over-all wage share in manufacturing, we appear to need just the reverse: an accounting for its tendency to fluctuate too much.

There are various ways of explaining the facts. Perhaps it is a fair

TABLE 3.—SHARE OF PRODUCTION WORKERS' WAGES IN VALUE ADDED, SELECTED MANUFACTURING INDUSTRY GROUPS, SELECTED YEARS, 1929-1934

Industry Group	Weight	1929	1935	1937	1939	1947	1951	1954	Variance
Food	.121	.268	.287	.291	.257	.285	.297	.281	.00019
Tobacco	.009	.238	.208	.215	.194	.273	.224	.222	.00064
Textile Mill	.072	.475	.575	.545	.499	.459	.540	.532	.00173
Apparel, etc.	.060	.355	.483	.483	.474	.454	.488	.490	.00233
Lumber	.034	.483	.541	.536	.502	.473	.493	.503	.00065
Furniture, etc.	.019	.422	.466	.470	.438	.475	.453	.454	.00020
Paper	.039	.359	.370	.360	.356	.352	.332	.362	.00014
Printing and Publishing	.057	.284	.287	.297	.279	.309	.339	.338	.00063
Chemicals	.072	.199	.206	.212	.189	.232	.212	.212	.00018
Petroleum and Coal	.027	.207	.237	.300	.256	.276	.265	.301	.00114
Rubber	.018	.385	.432	.465	.397	.472	.425	.407	.00109
Leather	.021	.464	.526	.528	.504	.473	.521	.509	.00066
Stone, Clay, Glass	.031	.417	.380	.389	.361	.431	.410	.392	.00056
Metals and Products	.158	.414	.450	.462	.427	.479	.424	.415	.00045
Nonelectrical									
Machinery	.105	.392	.446	.410	.380	.460	.438	.404	.00081
Electrical Machinery	.052	.341	.350	.369	.335	.423	.396	.357	.00109
Transportation									
Equipment	.079	.399	.497	.518	.494	.501	.477	.431	.00185
Miscellaneous	.028	.243	.370	.410	.372	.441	.434	.416	.00461
Total (Current Weights)		.358	.395	.402	.383	.407	.398	.382	.00028
Fixed-Weight Total		.357	.403	.406	.376	.408	.401	.389	.00036

idealization that the several industries buy their labor and capital inputs in the same or similar markets, so they can be imagined to face the same factor prices. If it is further assumed that each industry produces a single commodity with a technology describable by a smooth production function, then everything will depend on the distribution of elasticities of substitution among industries. If nearly all elasticities of substitution are on the same side of unity, then the wage shares will go up and down together in nearly all industries and there will be strong positive correlation. If elasticities of substitution are evenly divided on both sides of unity, there will be two groups of industries whose wage shares will move in opposed phase. Whether the net result is to increase

or reduce the variance of the aggregate wage share as compared with the hypothetical zero-correlation value will depend in a complicated way on the arrangement of weights and elasticities.

A special case occurs if each industry is imagined to produce a single commodity with a single fixed-proportions technique. Then every elasticity of substitution is zero and all wage shares move together. It is more interesting to recognize that each "industry" in Table 3 produces many commodities, some of which are complementary with each other in consumption and some of which are rival. Even if each commodity within an industry is produced by a single technique, it is no longer certain that the industry's wage share will rise and fall with the wage rate. The wage share for each commodity will rise with the wage rate, but those commodities whose production is labor-intensive will rise in price relative to others (assuming some degree of competition) and the intra-industry commodity-mix may shift in favor of capital-intensive commodities enough to decrease the wage share. The outcome depends in an easily calculable way on the factor proportions required by each technique and on the elasticities of substitution in consumption. If in addition commodities are producible with varying factor proportions, then once again the elasticities of substitution in production will play a role along with the other parameters [7, p. 8].

It must be admitted that none of this is very informative. It is all too static, too inattentive to technical change, too free with unknown and unknowable parameters—in a word, too neoclassical. It would be nice to have a single aggregative bulldozer principle with which to crash through the hedge of microeconomic interconnections and analogies. It is not inconceivable that the bulldozer may yet clank into view; but it is by no means inevitable either.

It is not clear how the newly popular widow's cruse theories (according to which the share of profits in income depends, given full employment, essentially on the rate of investment) can be made to apply on the somewhat disaggregative level to which my empirical results seem to force me. The stickiness of money wages, which forms the short-run side of Kaldor's theory [9, p. 95], may indeed have something to do with the results of Table 3, although that can hardly be the whole story. [The data next to be presented confirm the suggestion that Table 3's peculiarities are short-run in character.]

There are still other short-run facts that might help to explain the tendency of Table 3's industry shares to move together. An inclination to hoard skilled labor when output declines is one; the longer duration of collective bargaining agreements is another. In Table 4 the attempt is made to wash out some of the short-run effects by using decennial census data over a longer period of time. The layout is the same as that

of Table 3, but the coverage is necessarily poorer and the industrial breakdown cruder, because of changes in classification over the years. Broadly speaking, expectations are confirmed.

Once again, the use of fixed (1929) value-added weights results in only a slight increase in the variance of the aggregate wage share as compared with the observed totals. The variance of the observed totals is .0003, that of the fixed-weight totals is .0004. (Note that the difference between standard deviations, in natural units, is only the difference between .017 and .020.) Moreover, a good part of this small increase is due to the single very high observed wage share in transportation equip-

TABLE 4.—SHARE OF PRODUCTION WORKERS' WAGES IN VALUE ADDED, SELECTED MANUFACTURING INDUSTRY GROUPS, SELECTED YEARS, 1899-1951

Industry Group	Weight	1899	1909	1919	1929	1939	1951	Variance
Food	.121	.223	.212	.291	.268	.257	.297	.001
Textiles	.150	.462	.449	.368	.420	.488	.515	.002
Metals, etc.	.320	.453	.456	.476	.395	.400	.424	.001
Lumber	.073	.452	.488	.495	.465	.470	.480	.0002
Leather	.027	.532	.480	.405	.464	.504	.521	.002
Paper and Printing	.109	.357	.332	.331	.304	.304	.336	.0004
Chemicals	.064	.223	.216	.265	.119	.189	.212	.001
Stone, Clay, Glass	.038	.548	.543	.486	.417	.361	.410	.006
Tobacco	.014	.284	.288	.234	.238	.194	.224	.001
Transportation Equipment	.086	.671	.474	.440	.399	.494	.477	.009
Total (Current Weights)		.412	.389	.395	.368	.370	.400	.0003
Fixed-Weight Total		.424	.404	.404	.367	.384	.409	.0004

ment in 1899, together with the fact that the weight of this industry increased from 1899 to 1929. It seems just possible that the character of the output of the industry was changing around the turn of the century. Although this effect does not appear to be very strong in the data here analyzed, I suspect that analysis on a finer commodity classification might well show that shifts in the composition of output do have an effect in reducing fluctuations in aggregate shares.

The theoretical variance, calculated from formula 1 on the assumption of the independence of industry shares, is .00025. This is less than the observed figure of .00040, but probably not significantly so. (The standard deviations are .016 and .020.) In any case the wide discrepancy found in Table 3 has all but disappeared. This confirms the belief that the positive association of industry shares in Table 3 was essentially short-run in nature. For long periods in manufacturing, and even for short periods in the grosser sector breakdown of Table 2, the data are compatible with the hypothesis that subgroup shares fluctuate approximately independently through time; or, more accu-

ately, that positive and negative intercorrelations approximately cancel out.

/ In general, the data we have examined suggest the following: if by the "historical constancy" of labor's share it is meant that the share of the total social product imputed to wages has shown a marked absence of fluctuation as compared with the fluctuations of its industrial components, then this belief is probably wrong. Whatever exceptional stability there has been in the pattern of relative shares appears attributable to the components. This in turn suggests that there is no need for a special theory to explain how a number of unruly microeconomic markets are willy-nilly squeezed into a tight-fitting size .65 strait-jacket. A theory which wishes to produce the magic number among its consequences may have to say something about the component sectors among its premises.

### III. *The Character of Trends*

There are still some interesting problems to be found among the sectors and in the aggregates. One such—and some economists would no doubt prefer to phrase the whole "historical constancy" question in these terms—is the mildness of the observable trends in the sector shares and in the aggregate relative shares. The history of western capitalism is supposed to be characterized by a long-run accumulation of capital relative to labor. We expect this trend to result in *some* trend in the distribution of the product. Why do we not observe a stronger one?

First, let us look at the orders of magnitude involved. No great accuracy is possible because of the difficulty of finding a reasonable measure of capital stock, because no two available time series are conceptually identical, and finally because of the imputation problem involved. Roughly speaking, during the first half of this century the capital/labor ratio for the private nonfarm sector rose by about 60 per cent. But most or all of the increase took place before 1929. Between 1929 and 1949 there was little change, possibly even a decline. In manufacturing the contours were broadly similar, although the initial increase in the capital/labor ratio during the period 1909-1929 was considerably greater.<sup>6</sup>

So far as distributive shares are concerned, it is generally accepted that there has been a slight tendency for the labor share to increase secularly. But before 1929 the trend was approximately horizontal<sup>7</sup>

<sup>6</sup> I am leaving aside the period since 1949, which saw a new burst of net capital formation together with an approximately normal growth of the labor force.

<sup>7</sup> See for instance S. Kuznets [13, p. 86]. D. Gale Johnson's calculations [8, p. 178] show the labor share rising from 69.4 per cent in the decade 1900-1909 to 75.2 per cent

(with some short-run movements); between 1929 and 1949 there is a more pronounced upward tilt in the wage and salary share as Table 1 shows.

What lends mystery to this picture is that in the first quarter-century, when capital accumulates much more rapidly than the labor force grows, the distributive share picture shows little or no trend. But in the second quarter-century, when the growth of capital relative to labor slows down or ceases, the wage share begins to rise. It seems likely that the difference between the two periods may be tied up with a slightly higher rate of technical progress in the years since 1929.

But let us accept the notion that economic history shows us a strong tendency for capital to grow relative to labor. We are then led to expect a strong trend in relative shares. But which way? The neoclassical answer is that this depends on "the" elasticity of substitution, or rather on the distribution of elasticities of substitution on either side of unity.\*

Here we run up against the same kind of verbal question that occupied us earlier. What is a "strong" trend in relative shares? And what constitutes an elasticity of substitution "substantially" different from unity in terms of common-sense expectations? And how different from unity need the elasticity of substitution be in order that it convert a strong trend in the capital/labor ratio into a strong trend in relative shares? For the case of a two-factor, constant-returns-to-scale production function, it is not hard to calculate that the elasticity of the labor

share with respect to the capital/labor ratio is  $-S_K(1 - \frac{1}{\tau})$  where  $S_K$

is the share of property in income and  $\tau$  is the elasticity of substitution. Is an elasticity of substitution of  $\frac{2}{3}$  substantially different from unity? It means that a 10 per cent change in the relative costs of capital and labor services will induce a 6.7 per cent change in the capital/labor ratio. If  $\tau = \frac{2}{3}$  and  $S_K = .30$ , the elasticity of the labor share with respect to the capital/labor ratio is .15. Thus if the capital/labor ratio rises by 60 per cent (with  $\tau = \frac{2}{3}$ ) the labor share should rise by 9 per cent. And since the labor share hovers around .70, this means a rise of about 6 or 7 percentage points. But this is just the order of magnitude observed!

for 1940-1949, with nearly all the change coming after 1915-1924. Johnson's figures are for the whole economy and include, besides the direct compensation of employees, an allowance for the labor content of entrepreneurial earnings. The corresponding figures for compensation of employees are 55 per cent and 64.3 per cent. When restricted to the private sector, compensation of employees amounts to 53 per cent of privately produced income in 1900-1909, and 59 per cent in 1940-1949. When the allowance for entrepreneurial earnings is made on the private sector basis the figures are 68 per cent and 71.5 per cent.

\* Remember that shifts in the weights of different sectors in the total appear not to count for very much.

I don't mean to conclude from this example that yet another problem evaporates. But before deciding that observation contradicts expectation, there is some point in deciding what it is we expect. In this case what needs precision is the notion of substitutability, and the problem is complicated further by the need to consider changes occurring over varying periods of time.

There are even more fundamental obstacles to a clear evaluation of the argument about trends. An unknown fraction of society's capital takes the form of the improvement of human abilities and skills. Casual observation suggests that this fraction has been increasing over time. Correspondingly an unknown fraction of what we call wages, even "production workers' wages," no doubt constitutes a rent on that human capital. So the true quantitative picture is far from clear. If it were possible to separate out the part of nominal wages and salaries which is really a return on investment, the share of property income in the total might be found to be steadily increasing. An alternative way of looking at it is to say that investment in education, training, public health, etc., has the effect of increasing the efficiency of the human agent, so that a measurement in man-hours underestimates the rate at which the labor force grows as properly measured in efficiency units. In this case it might be found that the accumulation of nonhuman capital does not proceed at a faster rate than the labor force grows. These are intrinsically difficult distinctions to draw empirically, but they hold much theoretical and practical importance.

There are of course still other discrepancies between the data we have and the analytical concepts to which we pretend they correspond. The problem of imputing to labor a proper share of the income of unincorporated enterprises has received some attention. But even in the corporate sector possibilities exist for converting what is "really" property income into nominal labor income, and vice versa, and there are often tax reasons for doing so. If this were a random effect in time it would do no great harm, but in fact it may behave more systematically than that.<sup>9</sup>

To complete the catalog of uncertainties about trends, I ought to mention the intrusion of technical change between the simple facts of factor ratios and factor rewards. About the incidence of historical changes in techniques little is known, and without this it is difficult to know what residual remains to be accounted for.

<sup>9</sup> Johnson [8, pp. 180-82] shows that some part of the apparent increase in the labor share is to be attributed to such statistical artifacts as the growing importance of government-produced income, all of which is conventionally imputed to labor, and the declining importance of agriculture and therewith of home-produced and home-consumed goods.

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## ECONOMIC PROBLEMS IN AIR FORCE LOGISTICS

By HORST MENDERSHAUSEN\*

Economic analysis has only lately been applied to military logistics. The supply and transportation problems of the armed forces used to be sufficiently small and specialized in peacetime to be left to military routine; and sufficiently overshadowed by economic mobilization problems in wartime to warrant neglect even then. This is no longer true. As instantaneous readiness for combat has come to be ever more important for the armed forces and as the national resources devoted to military logistics in peacetime have grown to respectable size, the allocation of resources between alternative uses and over time can no longer be handled by simple routines or the magic of command. The logistics problems of the modern military establishment are sufficiently permanent and complex to invite economic analysis. The purpose of the present article is to demonstrate this for a particular part of the field, the Air Force sector, in which a good deal of analytical work has been done.

In recent years, the United States has been spending nearly \$20 billion annually on its Air Force. This stream of funds is channeled to certain military-political tasks and to certain organizations and weapons that may meet these tasks. The problem of how to make these fundamental allocations will not hold us here; but we shall be concerned with the efficiency of the Air Force in providing for the chosen tasks with the resources at its command.

Efficiency problems, costs and resource implications also enter into the selection of the tasks and the principal weapons themselves. There are no absolute military requirements just as there are no absolute standard-of-living requirements. But assuming that the objectives are properly defined and the means well chosen, the activity still may be "too expensive"—because it is inefficient. Conversely, because of inefficiency, the military program may skimp on important provisions and fail to meet worthy objectives.

This problem is the logistics problem par excellence. How can the Air Force maximize the military capabilities that given budget resources afford; or put differently, how can it minimize the cost of

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attaining stipulated capabilities? In what directions can improvements be found? How can Air Force practice be brought closer to an "optimum"? Logistics research is meant to answer questions of this sort.

### *I. The Air Force Logistics System*

The Air Force logistics system comprises many institutions and activities ranging from industrial contractors to the combat units. Contractors' activities extend from production of weapons and parts to stockage, transport and maintenance work. Air Force depots deal with purchasing, repair and major maintenance work, and with the "wholesale functions" of stock-keeping and distribution. Air base logistics activities connect with contractors or Air Force depots, include stockage at the "retail" level and extend forward to the maintenance functions attached to squadrons, missile sites, etc. Transportation weaves through this entire system, carrying new materiel forward, reparable items backward, stock reallocations sideways, and projects outward into the carrying of combat units and their supplies to destinations. The communications system is a vital part of the whole.

The size of the logistics system escapes precise measurement because it resists precise definition. Etymologically, logistics is what it takes to "quarter troops"; translated into present-day organization and technology, this may mean the entire military budget, and more. But when military people speak of logistics today, they usually mean the functions of procurement and supply, maintenance, and transportation. The Air Force expenditures that can be more or less readily assigned to these functions, across all commands, are shown in Table 1. Even excluding investment expenditures outside the Air Materiel Command (e.g., for installations), and expenditures on operational supplies (e.g., fuel), motor pools—all of which might well be counted as logistics too—these expenditures take up about two-thirds of the Air Force budget.

In any sense, Air Force logistics is a vast enterprise. With many thousands of air vehicles to support, more than a million distinct articles ("line items") to supply, \$14 billion worth of inventory to stock, and 15 continental and 5 overseas depots and about 250 air bases to manage, the Air Force logistics system matches in complexity any existing organization.

### *II. A Typical Logistics Problem*

The typical logistics problem is a variant of the classical production problem. Stated in the "economy version" (given the output objective, minimize input),<sup>1</sup> the problem has the following shape: An operational

<sup>1</sup> In the "efficiency version," total input (e.g., the budget) is given, output to be maximized.

TABLE 1.—LOGISTICS FUNCTIONS IN THE AIR FORCE BUDGET, FISCAL YEAR 1956

Command	Expenditures on Functions* (millions of dollars)				
	Procurement and Supply	Maintenance	Transportation	Overhead AMC	Total Logistics Functions
Air Materiel Command					
Aircraft and related procurement	6,074	—	—	—	6,074
Other procurement	1,182	—	—	—	1,182
Operating expenditures	275	874	134	770 <sup>b</sup>	2,053
Strategic Air Command	73	223	8	—	304
Tactical Air Command	19	59	3	—	81
Air Defense Command	27	100	3	—	130
Military Air Transport Service	25	120	44	—	189
Air Training Command	45	140	6	—	191
Air Research & Development Command	14	34	2	—	50
U. S. Air Force, Europe	32	71	10	—	113
Far East Air Force	33	66	5	—	104
Other Commands	43	85	10	—	138
All Commands, logistics functions	7,842	1,772	225	770	10,609
All Commands, other expenditures					
Investment expenditures, not AMC	—	—	—	—	1,340
Other operating expenditures, not AMC	—	—	—	—	4,761
Total Air Force expenditures	—	—	—	—	16,710

\* Including military and civilian personnel expenditures, materiel and contract services consumed in performing these functions, and Headquarters services.

<sup>b</sup> Including \$76 million for construction of AMC installations. Installation expenditures by other commands are not included in the expenditures on logistics functions; they appear under "Investment Expenditures, not AMC."

Source: U. S. Air Force, AFC-100, Expense Account Report, 3 October 1956; and information obtained from the Bureau of the Budget.

program of the Air Force is to be fulfilled. Various resources must be combined to attain the objective. Units of each of these resources are available at certain costs. The resources can be combined in various ways which may be expressed in a logistics model (production function). The desired combination can be defined by a certain criterion, e.g., minimum total monetary cost.

Suppose the logistics system is given the task of supporting at minimum cost a program for a certain aircraft type. The program consists, let us say, of having a certain number of aircraft operationally ready,

that is, fully equipped and *not* out of commission for lack of parts or maintenance. The system may do three things: buy aircraft, supply spare parts, and provide personnel and equipment for maintenance work. With a larger number of aircraft procured, the program may be met despite the fact that some aircraft will be out of commission for parts (AOCP), for maintenance (AOCM), or not fully equipped (ANFE). With a more effective supply of spare parts, the program may be met through a reduction of the number of AOCP's or ANFE's; and with more effective maintenance, through the reduction of AOCM's. From the point of view of the military objective it is immaterial in which of the three ways the operationally ready aircraft are generated.

Assume, for simplicity, that supply and maintenance are each homogeneous activities, measurable in dollars, and that the cost of one unit of each of these three activities is independent of the amounts purchased. The analysis may begin by considering a certain number of aircraft obtainable through procurement. It may then look for the various combinations of supply and maintenance which will keep the number required by the program operationally ready. Suboptimization leads to the least-cost combination of supply and maintenance and its cost. The suboptimization is then repeated for other numbers of aircraft available.

Once we know the best combinations of supply and maintenance (logistics support) to use with each number of aircraft available, we may consider combinations of aircraft purchases and current support costs that can achieve the program. Finally, we may find the combination of aircraft, supply, and maintenance which costs the least.

The curve in Figure 1 suggests combinations of spare parts supply and maintenance with which the program can be achieved with a given number of available aircraft,  $A_1$ . (Since for one reason or another some aircraft will be out of commission for lack of support,  $A_1$  will be larger than the number of operationally ready aircraft called for in the program). The logic of the isoquant is that supply and maintenance may be substituted for each other, for example, by reducing repair facilities and supplying whole assemblies rather than bits and pieces of spare parts.

The "budget line" shows the possible combinations of supply and maintenance which a budget,  $L_1$ , can buy. At point  $d$ , the rate at which we can substitute supply for maintenance and still support the program is equal to the rate at which we can make the substitution and still keep support costs constant. This offers the suboptimal allocation in the case of  $A_1$  available aircraft; the program can best be supported by incurring  $M_1$  cost of maintenance and  $S_1$  cost of supply. In Figure 2 the suboptimization is extended to situations where fewer aircraft and smaller budgets are available.

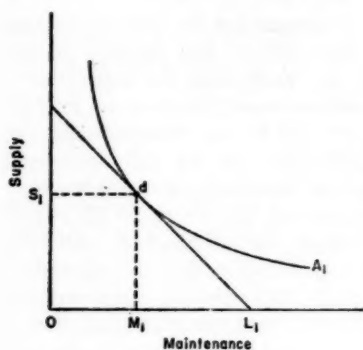


FIGURE 1

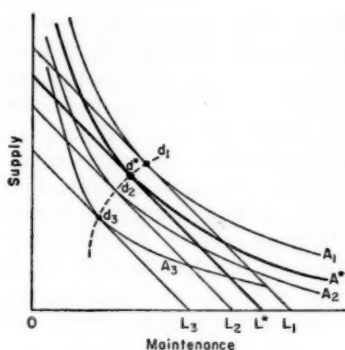


FIGURE 2

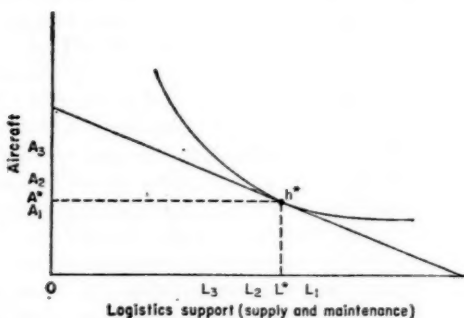


FIGURE 3

Figure 3 shows the allowable trade-offs between aircraft and the sum of supply and maintenance costs. For each number of aircraft the isoquant curve shows the minimum cost of logistics support which must be incurred if the program is to be achieved. The optimal combination of aircraft and logistics support depends on the relative costs of aircraft and logistics support. If aircraft cost, say, \$2.5 million each, the "budget line" has a slope of minus 2/5; for, in order to keep the total budget constant, logistics support costs must be reduced by \$2.5 million whenever the number of aircraft is increased by one. The optimal combination of inputs is found at point  $h^*$  where the rate at which we would be willing to substitute one input for another is just equal the rate at which we are able to do so.

The minimum budget necessary to support the program appears now

as  $L^*$ , plus \$2.5 million times  $A^*$ , that is to say, the cost of optimal logistics support, plus the cost of one aircraft times the optimal number of aircraft; and the optimum allocation of support funds between supply and maintenance appears in Figure 2 as the coordinates of point  $d^*$ .

So far, we have treated all the relations in this three-way trade-off problem as if they were certain; but in reality all of them are subject to uncertainty: the exact configuration of the aircraft, or of successive batches of the "same" aircraft that become available; the way they are used; the demand for spare parts that will appear in time; the demands on the maintenance establishment; its ability to do the required work in time; the real costs of making supply and maintenance support available; and thus the production surface itself, let alone the budget available for the aircraft and supporting activities. At the time when the problem calls for a solution, *i.e.*, when procurement and support plans have to be laid, or when aircraft and logistics resources have to be allotted to squadrons, all of these factors are more or less uncertain.

Some uncertainties lend themselves to a probabilistic treatment. They relate to observable variables, the probability distribution of which can be estimated. The parameters of such a distribution will offer more information about the uncertain event than a sample average that may be known, and this information may lead to better management of the variables.

This kind of opportunity exists, for instance, in the field of demand for aircraft spare parts. Demand for such parts often occurs over time in a fashion well described by the Poisson probability distribution, or the negative polynomial distribution [Brown, 3]. Other opportunities may be found in the maintenance and transportation fields where the queuing of items awaiting repair or shipment and other factors lead to random fluctuations in repair and transport times respectively. An understanding of these random variations can pay off for the Air Force, just as insurance can for the man who knows that there is a risk of fire. Next to the basic economic calculus, probability thinking is most important in the analysis of logistics problems.

This is not to say that it can always be applied in full-blown quantitative fashion. Considering the range of uncertainties that beset the logistics business, only a small segment is accessible to precise probability calculations. Over what span of time a certain weapon will develop to its final configuration (if there is such a thing as a final configuration in this rapidly changing field); in what manner it will be used (intensity of flying practice, kind of mission, alerts, war, what kind of war); how the logistics support will be organized (under what

commands, by what techniques, in the Air Force or through private contractors)—all of these questions present alternative outcomes that defy precise probability calculation. This does not mean, of course, that the consequences of some of these uncertain events cannot be elucidated by study.

Indeed, the benefits that can be derived from economic analysis are often greatest where the outcomes are least calculable, that is to say, in planning for the future. Consider the basic economic principle that no output can be judged to be right in ignorance of the costs of its production. In military planning, it happens frequently that certain "outputs" are postulated as "needed" without regard to cost. The unknowns surrounding an entirely new weapon, such as a large ballistic missile, may be very great. Yet certain operational desiderata (e.g., readiness time, or rate of fire) may be laid down without regard to their implications in personnel, materiel or development time. Resource availabilities may be specified as well, but without regard to the limitations these resource quantities impose on operational capabilities in time. A fairly simple analysis of the technical and organizational features of missile operations, including the play of random factors, may develop some trade-offs between operational capabilities and resources and thus lead to a rational choice between attainable combinations.

### III. *Specific Logistics Problems*

Looking for more efficient uses of resources is, of course, no monopoly of economists. Engineers, military officers, and other specialists are doing that too. But economists are accustomed to pursuing this search over a broader area, beyond the confines of a special technical field, limited only by the abstract concepts of input and output; this makes the economic approach useful in this field. Many of the trade-offs arise between separate functional areas. Each of these may be managed efficiently enough, and yet in combination they may not be. Because of the concern of all technicians with efficiency *within* their limited fields, and the tendency for intrafunctional efficiency to be mistaken for efficiency of the whole, there is a real need for an approach that cuts across the functions and looks for trade-offs between them. They all cost money. Some examples of such trade-offs will now be given.

#### A. *Phasing-in a Weapon System*

Modern weapons are complex and their useful lifetime is short. The Air Force is constantly adopting new engines, airframe features, fire control systems, and other details on existing "weapon systems," and

it is constantly developing and phasing-in entire new weapon systems.<sup>2</sup> The adoption of new details leads to "technical orders" that instruct the using organizations to change certain features on existing airplanes or other equipment, to remove certain pieces and to install new ones. The phasing-in of an entire new weapon system leads to conversion operations under which the using organizations, unit by unit, convert from an old weapon to the new. These change-overs pose considerable logistics problems, and their handling has a far-reaching influence on the effectiveness and the cost of the Air Force.

1. *Conversion.* The principal problem in conversion is to have all the adaptations in the system come off on time so that the tactical units receiving the new weapon can operate and service it, and simultaneously abandon the old weapon. Some resources may be transferable from the old system to the new, some parts, ground-handling equipment, hangars, crews, etc. Other resources—and they represent an ever-increasing proportion because of the growing intricacy of the weapons—are specific. A new assortment of parts, new engine starters, ramps, and so forth, are needed to handle the new aircraft. Maintenance crews have to be retrained, skills reportioned, and all this needs to be done in time, so that the conversion causes the least possible loss in military effectiveness.

What are some of the conceivable trade-offs in this scheduling problem? The first trade-off may be between the number of new weapons and the size of maintenance support, supply support, or both. For instance, early in the phase-in it may be advantageous to give the bases more maintenance specialists and fewer aircraft than usual, because maintenance of the new equipment is the dominant problem. Similarly, it may be advantageous to give a new missile site greater stocks of propellants to allow for extra launch attempts on equipment that is still fairly unreliable, rather than giving the base more missiles to handle. A second trade-off may be between one item of logistics support and another, say, between the keeping of stocks of parts at bases and at depots, or between large parts inventories in the whole system and more efficient communication and transportation between bases, depots and contractors. A third may be between Air Force and contractor maintenance at the bases. The recognition of these logistics trade-offs may increase the effectiveness of the new weapons, and thus offset earlier delays in the development of the weapons.

2. *Telescoping of Development and Operations.* The development of

<sup>2</sup> A weapon system is the combination of air vehicle, armament, ground support, etc., that is to perform a mission. The "phase-in" is the process in time by which the system becomes an operating part of the Air Force, the activation of units, delivery of equipment to them, etc.

a weapon and its introduction into the tactical units of the Air Force tend to overlap more and more. On the one hand, the novel and complex weapons have many "bugs" that it takes time to eliminate. On the other hand, the Air Force is anxious to profit early from the fruits of development and to equip its units with weapons that can match those of an enemy. The long development time of the "final" weapon and the desire to make the weapon operational as soon as possible tend to telescope development and operational use into each other. The gains from this telescoping are obvious, but so are the costs: combat weapons are tied up in elaborate modifications; aircraft and missiles, engines and parts are ordered into production that may be obsolete before they reach the operating units; contractors' plants are tooled up for models that will not be produced, and so forth.

The trade-offs are beset with particularly high uncertainties. Wishing to buy time, the Air Force may turn to regular production of an early untried design, and when "bugs" appear, saddle itself with the expense for repeated tool-ups of the producer and costly modification programs—and long out-of-commission times—for early delivered aircraft. Prolonged experimentation with a few prototypes, on the other hand, may save time by reducing the unknowns, reveal the potentialities of various designs and combinations, and reduce the costs of retooling and later modifications. The merits of the two approaches cannot be fully determined here [Klein, 8]. But certainly the second course puts a far more manageable burden on the logistics system than the first.

### *B. Supply Support*

Uncertainties of a more homely sort pose interesting problems in supply support. The Air Force must predict its demand for fuel, engines, spare parts, etc., so as to provide the right material at the right place and at the right time. On the basis of these predictions it must buy and distribute material to depots and bases. The time lags of budgeting, procurement, paper work and shipping determine the time scale of the predictions.

For some things, demand is more predictable than for others. If a certain flying program is fixed—and adhered to—the demand for fuel is relatively predictable, and so is the demand for engines and components that have to be replaced according to "time change" rules. Even for aircraft spares, demand can be predicted with a variable degree of accuracy if certain precautions are taken, e.g., if system-wide rather than particular base demands, demands for substitutable items or otherwise grouped "families of parts" are considered, and provided, of course, that some relevant demand experience is available [Goldman,

6]. Failure rates may be calculated on an actuarial basis [Arnold *et al.*, 1]. But for a large number of aircraft spares, demand uncertainty remains very high, especially at base level, and among these can be found expensive "insurance type" items as well as a host of cheap bits and pieces.<sup>3</sup> In any event, of course, prediction rests on experience, well-kept records and sensible analysis.<sup>4</sup>

The real costs of bad demand predictions are shortages that condemn weapons to unreadiness, or excessive and obsolescent stocks, or excessive reliance on crash orders and the costly expediting of production or shipping. The actual out-of-pocket costs probably eat up several per cent of the Air Force budget.

There exist at least two promising ways for reducing the excessive costs of supply support. One consists of improvements of the way in which parts, particularly the more expensive components (with usually rather long production lead times), come into the Air Force system; the other of a more rational system of meeting supply and stockage requirements of parts, particularly of the cheaper variety. The first approach attacks the uncertainty problem from the flank, the second frontally.

Before saying more about these approaches, let us note that the Air Force made an important step in the direction of supply economy when it undertook in 1952-53 to sort out its equipment and the myriads of spare parts into cost categories. Holding costs, obsolescence risk, etc., obviously pose very different problems for nuts and bolts on the one hand, and for cockpit canopies, whole wing assemblies or landing gear units, on the other. Accounting should be more careful, procurement and distribution more circumstantial for expensive than for cheap items. By forming three cost categories of items, and setting high-value items aside for special management, the Air Force started on the right way.<sup>5</sup> Along this way, it may now combine item cost with demand char-

<sup>3</sup> Some people expect that demand for missile spares will on the whole be more predictable than demand for aircraft spares, because parts replacement on the missiles may be governed to a greater extent by time-change rules, and operating conditions may be more uniform than for manned aircraft. This remains to be proven.

<sup>4</sup> The statistical data collected in the Air Force offer much room for improvement. Even where the prospects for prediction are fairly good, the basis is often weak because records are unintelligently organized, or prematurely destroyed, sampling methods are faulty or not used, and so forth.

<sup>5</sup> The "Hi-Valu" program of the Air Force, launched in the fall of 1952, provided for special procurement and inventory procedures for items of more than \$10 unit cost which, following an item-ranking by expenditure (quantity times unit cost), constitute about one-half of the value of a particular procurement contract.

Since 1955, such items have come to be known as "Category I (Hi-Valu)." They make up about 2 per cent of the total number of airborne spares, and 64 per cent of their total procurement value [12, pp. 40-41]. All other items costing more than \$10 apiece are called Category II items. Category III items cost less than \$10 apiece.

acteristics and other variables and thus make the treatment given to different types of items in supply more discriminating from an economic point of view.

1. *Deferred Procurement.* The flanking attack on demand uncertainty accepts the fact that demand is virtually unpredictable for the early part of a weapon system's phase-in. But it rejects the necessity for the Air Force to rely on the unavoidably inaccurate early estimates and to buy quantities of expensive spare parts accordingly, several years in advance.<sup>6</sup> It seeks to meet uncertainty with flexibility.

The rationale of this approach is that buffer stocks of spares are now employed at contractors' plants to smooth the production process, and that these stocks, if somewhat enlarged and properly managed, could cover replacement demands arising from the first few test and operational units of a new weapon. Repairable "carcasses" of parts, taken off the whole weapon, could be returned to factory or depot for repair and then be set aside to form the first Air-Force-owned stock of the parts. As this process rolls on, the Air Force would accumulate a small stock of its own, and gain the demand experience needed to make a reasonable estimate for major procurement. The major procurement would be postponed until well into the phase-in of the operational aircraft or missile.

This approach involves, of course, certain new costs, but these costs seem to be much smaller than the savings on inventories and obsolescence, at least for the relatively expensive articles [Petersen, 11]. Net savings may range from 30 to 60 per cent of the total cost of these items under the present supply system and amount to hundreds of millions of dollars. Air Force and aircraft manufacturers have shown much interest in the approach, and some new weapons are going to be supported in this fashion.

2. *Improved Requirements and Distribution Calculations.* While logistics studies show that the Air Force tends to err by investing too much money, and too soon, in expensive spares, they indicate that it tends to be too parsimonious in stocking the bases with cheap parts [Karr, 7]. It costs relatively little to lean over backward in stocking low-cost items in depth if the supply process is managed properly. On the other hand, the keeping of ample stocks can avoid numerous instances of aircraft being put out of commission for lack of bits and pieces. The uncertainty of demand for cheap parts can be met most

<sup>6</sup> A typical weapon phase-in stretches over 2 to 4 years. Production lead times on major components range usually from 1 to 3 years. Under current procedures, 2 to 3 years may easily pass from the first major spares contract to the appearance of the first sizable batch of demand data from operational aircraft. In the absence of reliable data, Air Force procurement officers tend to reduce the risk of parts shortages for new weapons by interpreting the engineering estimates of support requirements rather liberally.

economically head-on, i.e., by ample insurance in the form of stocks.

The supply method for the cheaper parts can be improved by balancing holding costs against reorder costs in computing economical order quantities, and by balancing savings in shortage costs against costs of adding units to stock or pipeline in computing economical reorder levels. Several important variables enter into the estimation of these costs: the costs of storing, interest and obsolescence enter into holding costs; the costs of priority measures (and other factors) into shortage costs. The theory of inventory control provides the key to these improvements [2, 4]. The results, for practical application in Air Force logistics, may take the form of tabulations of economical order quantities and reorder levels for certain demand rates, unit prices, pipeline times and shortage costs; or corresponding "programs" for electronic computers [Ferguson and Fisher 5; 13]. At the cost of somewhat larger base stocks of low-cost items, this approach promises to reduce considerably the shortage costs of the supply system. It applies to the calculation of spares requirements for the Air Force as a whole, and to the allocation of spares to bases and depots.

3. *Centralized, Automatic Control.* Controlling the Air Force supply process is quite a formidable task. Many decisions are being made day-in and day-out to order, ship, process and reroute materiel and to stock and release items at the many supply installations. A vast flow of paper accompanies the flow of materiel and the production of the statistical data needed for decision making. This information and decision process poses interesting technical and economic problems. It is cumbersome and expensive despite improvements that have been brought about through organizational devices and through the introduction of business machines. The "paper mill" is still slow, information fragmented, and clerical errors abound.

Electronic computers with large "memories" are capable of controlling inventories far more effectively. They can make many of the routine supply decisions simultaneously and produce many of the data. Data processing centers may obviate the labor of many clerks on Air Force installations, turn out automatic shipping orders and other messages, and assemble statistics that afford a virtually complete and instantaneous view of the inventory and flow of materiel. Combined with high-speed communication, these devices can lead to a revolution of the logistics process.

The technology of such a control system is now in view, and parts of it have been put to practical tests [Nelson and Tupac, 10]. But important choices remain to be made in which economic analysis will have some part. Considering the organizational changes and large investments in equipment that are involved, how can the benefits of the sys-

tem be measured in terms of effectiveness and cost savings? How far should centralization and automatization be pushed? Undoubtedly, the technological possibilities of the system can be exploited to introduce new economic considerations into military supply management. Up to now, some of these considerations could be applied only in very rough form (e.g., item cost, through the setting up of a few cost categories), and others not at all (e.g., shortage costs and holding costs).

### *C. Investment in Airlift*

Lest the reader feel that economy in logistics is only a matter of spare-parts management, the last example will deal with a very different subject. This is a problem of a rational investment program over time. The aim of the investment is the continual availability of a sufficient capacity for long-range military airlift at minimum cost.

Like all weapons, military airlift is subject to the forces of changing requirements, technological change and obsolescence of existing equipment. Foreseeable demands on airlift vary with changing requirements for peacetime transport capacity by the Air Force itself, and for war-time transport by Air Force and Army. Turboprop and turbojet-powered aircraft of greater range and speed have become available for procurement. The existing Military Air Transport Service (MATS) fleet, while purchased and paid for, continues to exact a price in terms of upkeep and especially manpower, and it may be too small.

But perhaps more than other weapons, airlift offers a refuge to non-economic thinking. Calculations of military economy seem to be less necessary for airlift because transport aircraft, unlike bombers and fighters, do not enter into direct competition with enemy forces; and calculations of a business nature (ton or passenger miles versus costs) do not seem to apply because the Military Air Transport Service is not an airline. Its main purpose is training for emergency use. This leads to some danger that the Air Force will have to get along with relatively costly and increasingly ineffectual types of equipment, because there is no accepted rationale for investment in airlift.

To escape this impasse, a method is needed to compare the relevant costs of alternative air transport fleets over time and to select from various attainable sequences of fleets the one that promises to meet postulated requirements at lowest cost. Such a method has been developed and applied along the following lines [McGuire, 9].

Alternative air transport fleets were considered, consisting of numerous combinations of designed and tested aircraft types. The productivities of each aircraft type were measured in terms of passenger and cargo-carrying capacity, speed, range, runway and loading characteristics; and comparative rates of substitution were established among the

competing types. Alternative fleets were then formed by selecting possible combinations of numbers of existing, phasing-in and phasing-out aircraft, over a specified period ahead, say, 10 years, subject to the current availability of the aircraft in Air Force inventories and to the production facilities, existing or buildable, for additional aircraft over that period.

All of the selected fleets had to meet the output requirements of a foreseeable maximum wartime transport load, *e.g.*, the requirements attending the deployment of a mixed task force for limited war to a foreign theatre of operations, in addition to meeting the normal and continuing resupply requirements of the U.S. Air Force. They had to be suitable to meet these requirements in terms of a specific route structure and desirable service frequencies.

On the cost side, all new resource outlays to create and operate these fleets in peacetime were considered. No sunk costs were allowed, and no wartime operating costs taken into account. The relevant costs, in other words, consisted of new outlays to produce that state of peacetime readiness required for emergency use. The various selected sequences of air transport fleets were then compared with respect to their cost in new money and in manpower. Manpower requirements were considered separately, because the Air Force usually operates not only under monetary budget ceilings but also under manpower ceilings. One of the fleets involved a minimum of new procurement and others, procurement of various sizes and kinds.

The study showed the marked diseconomies in money and manpower that would flow from following a "least-procurement" policy. It also showed that an economical fleet would employ a large number of newly procured transport aircraft.

#### *IV. Laboratory Simulation*

Logistics research applies economic and statistical thinking to the problems of a peculiar industry. In many ways, it resembles economic research in other areas. But some special features of the "industry" have led to the development of a new technique as a part of research: laboratory simulation of the management process. It consists of a reproduction on a reduced scale of the Air Force milieu and the activities which are the object of inquiry, and of the testing of alternative policies and procedures within this framework.

The first logistics simulation laboratory, which was set up at the RAND Corporation in Santa Monica in 1956-57, has several aims. It is an extension of research in the direction of designing logistics management procedures, testing their feasibility and comparing their effectiveness and cost with other procedures. It makes it possible to bring

under study the interactions of Air Force commands, command echelons and functions which cannot be covered by any formula. It is also an educational device for theoreticians and practitioners in logistics.

In its first application, the laboratory was used to design a logistics system for a hypothetical Air Defense fighter aircraft. This system incorporated the results of three studies mentioned above, *i.e.*, deferred procurement of high-value spares, economical procurement and distribution of other parts, and centralized electronic data processing. Parallel to this system, a laboratory replica of current Air Force logistics was created to serve the same task. Both systems went through several "years" of operation, from phase-in to phase-out of the fighter, on a number of "bases" and under a realistic command structure.<sup>7</sup> In the course of this run, significant differences between the two systems were found; the new system was at least as effective as the old, and at much lower cost. In the future, the laboratory may be used to study other facets of Air Force logistics and test other ideas.

This is not the place to go into the details of the experiment, the problems of design, laboratory management, the use of electronic computers and of personnel drawn from various academic disciplines and from the Air Force itself. Nor has the time come when the contribution of laboratory simulation to the understanding and management of logistics can be fully evaluated. The hope is, of course, that it will help avoid some expensive and disruptive service-testing in the Air Force and advance the starting point of those service tests that need to be made. It has become quite clear that the laboratory is effective in stimulating and rounding off logistics studies and in educating logistics personnel in the economic problems of their field.

The simulation technique seems to answer an old need of economics and other social sciences for a laboratory in which the object under study can be manipulated and observed more closely. But the applicability of the technique in logistics rests on a special feature of the subject. The activity in which economy is being sought is a managerial process and forms a virtually closed circuit. A logistics laboratory does not have to allow for a welter of independent decision-units (producers, consumers, organizations) following their own purposes with regard to an infinite number of goods and services. Instead, it encompasses representatives of certain functions in a hierarchical organization that execute a single plan. The goods and services involved are limited in number and kind. To be sure, the "single plan" is usually a whole pattern

<sup>7</sup>Time compression, which reduced a day of actual operations to 30-40 minutes of laboratory time, made it possible to act out several years of operations in a few months. Bases, commands, depots, contractor's factory, etc., were abstracted and modeled so as to fit the capacities of a few dozen people in the laboratory.

of plans pursued by different commands, with gaps and contradictions that call for judgment and decisions at various levels—the military hierarchy leaves many important decisions to lower echelons—and the execution is no mechanical matter. Still, compared to the national economy, the logistics system is a monolith. It has, however, much in common with the internal activities of many a large corporation. The Air Force's pioneering in the laboratory simulation of a large-scale management process may indeed lead to similar experiments in the management of corporations.

### V. Conclusion

It is not surprising to find that a developing contact between two disciplines leads to two-way traffic. The infusion of economic concepts and methodology into military logistics promises to help in the handling of complex problems and the development of a more rational use of human and material resources. The receptiveness of military men to economic thinking has increased considerably over the years. This is true for all of the military services. Many of their problems turn out to be quite similar once they are lifted out of their peculiar institutional context and looked at as problems of resource allocation. To economists, on the other hand, this field offers not only a new area of application but also opportunities for the development of techniques that may prove to be valuable elsewhere.

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## COMMUNICATIONS

### Response of Consumer Loans to General Credit Conditions

Vigorous growth of consumer credit throughout recent periods of general credit stringency has led to the widespread belief that this type of credit is not responsive to general credit conditions. Outstanding instalment credit increased \$5 billion or by nearly a third from mid-1952 to mid-1953 when credit conditions were tightening. Again, instalment credit expanded by nearly a third from mid-1955 to the fall of 1957 when credit conditions were also tightening.

Consumer credit's reputation for insensitivity to general credit conditions has been widely accepted by both economists and bankers.<sup>1</sup> Advocates of selective credit controls eagerly accept the insensitivity of consumer credit as an argument to support their positions. Many opponents of selective control also have accepted the insensitivity of consumer credit and have argued against selective controls on other grounds.

This reputation for insensitivity, however, may be based erroneously upon the unusual strength of the demand for consumer credit rather than upon any unique lack of responsiveness to general credit conditions. Bullets fired into a wooden block at different velocities penetrate to different depths. Similarly, different types of credit under different demand pressures can be expected to penetrate the restrictions of general credit conditions by different degrees. The mere expansion of consumer credit during periods of credit restraint is not proof of its insensitivity to general credit conditions.

The impact of credit policies falls unevenly on individual commercial banks. When credit policies are designed to hold total reserves at a constant level or to limit the increase in reserves to a gradual rate of growth, some banks lose reserves while others gain reserves. The banks that lose reserves must limit their loan activities or liquidate part of their portfolios while the others are relatively free to expand their loans and investments. Individual banks in a given locality face similar local markets and similar general demand conditions but may have different deposit experience.<sup>2</sup> A comparison of the loan and investment policies of banks that have lost reserves with those of banks of a similar type and size that have gained reserves should give some insight into the adjustments that individual banks make under tightening credit conditions.

The study described below (1) examines lending activities of commercial banks under different degrees of credit stringency, as indicated by deposit experience, but under similar conditions of demand, and (2) compares the re-

<sup>1</sup> Warren L. Smith in a review of the comprehensive study of consumer credit undertaken by the Federal Reserve System concludes that "... most of the participants seem to feel that consumer credit . . . is rather insensitive to general instruments of monetary policy." "Consumer Instalment Credit," *Am. Econ. Rev.*, Dec. 1957, 47, 983.

<sup>2</sup> Comparison of the geographic location of the banks studied indicated that the differences in deposit experience were not related to differences in location.

sponsiveness of consumer lending to that of other types of loans and investments under these conditions.

Two samples of banks were selected for study. One sample included 28 of the 32 largest consumer credit lenders.<sup>3</sup> All of these were among the 100 largest banks in the country when classified by deposit size. In many cases however, their consumer loans were a relatively small part of their total loans and investments. The second sample consisted of 35 medium-sized banks (i.e., with deposits of \$10 to \$50 million) that specialized in consumer loans. All of these banks had more than one-third of their total loans in loans to consumers.

Each of these samples was divided into two parts according to the deposit experience from mid-1955 to the end of 1956. Banks that lost deposits or showed a smaller than average gain (as indicated by statistics for banks in leading cities) were included in one group, and the remaining banks that showed larger than average deposit gains were combined in the other.

Throughout the period from mid-1955 to the end of 1956 strong credit demands from all sectors pressed against limited supplies in credit markets. Demands for consumer credit were particularly strong in the last half of 1955 when the already large credit demand for purchases of new cars was reinforced by a competitive easing of instalment credit terms. Down payments were reduced and standard maturities on new cars were frequently extended from 24 to 36 months. From mid-1955 to the end of the year outstanding automobile credit increased nearly \$2 billion or 15 per cent and total instalment credit increased \$3 billion. In 1956, consumers' demands for funds continued, but at a reduced rate, while business demands were especially heavy.

The Federal Reserve System maintained a general condition of restraint on credit throughout the last half of 1955 and all of 1956.<sup>4</sup> As a result total reserves of member banks changed relatively little during this period and banks were able to expand their loans only by more complete utilization of reserves and by selling securities. Except for a brief period early in 1956 member-bank borrowings were larger than their excess reserves. Interest rates rose steadily through the last half of 1955 and all of 1956.

The experience of some banks was much better than that of others during this period. Shifts in deposits provided many banks with reserves which permitted them to expand their loans in response to the heavy demands. Such gains, however, were at the expense of other banks as there was no over-all increase in reserves. Banks that lost deposits were forced to restrict their lending activities or to reduce their investments to obtain funds for the expansion of their loans.

### *I. Experience of Large Banks*

Thirteen of the 28 large consumer lenders (the first sample) either lost deposits from mid-1955 to the end of 1956 or showed smaller than average gains. The combined deposits of these 13 banks increased only slightly during

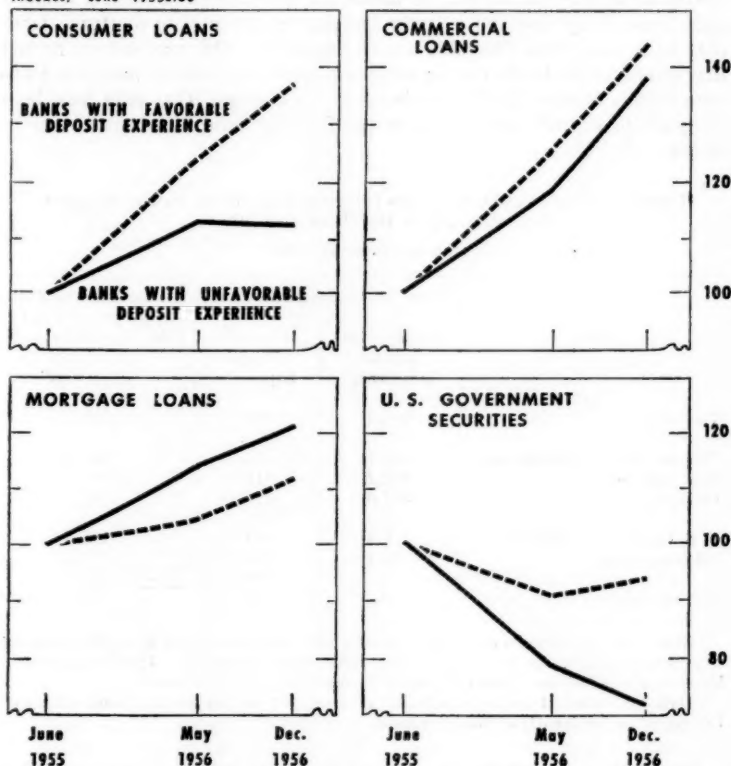
<sup>3</sup> Data were not available for four of the 32 largest banks.

<sup>4</sup> *42nd Annual Report of the Board of Governors of the Federal Reserve System*, pp. 5-6 and *43rd Annual Report*, pp. 13-14.

CHART 1

## CHANGES IN LOANS AND SECURITIES - LARGE BANKS

Indexes, June 1955=100



*Note:* May was used as a dividing point for the entire period because reserve positions reached their tightest point (as indicated by the excess of borrowings over excess reserves) in that month.

the period while the deposits of the other large banks increased about 15 per cent.

The effects of the loss of deposits were apparent in nearly all of the major portfolio items of the 13 banks affected, as shown on Chart 1. Although they expanded their consumer loans from mid-1955 to the end of 1956, the increase was only one-third as large as that at banks with more favorable deposit experience. Both groups of banks increased their commercial loans but the expansion was greater at the banks with deposit gains. Both groups of banks reduced their holdings of U. S. Government securities but the decline in

the case of banks that lost deposits was more than four times that at the banks with more favorable deposit experience.

The only exception—among the types of assets studied—to this pattern of restrictive activity on the part of banks that lost deposits occurred in mortgage loans. They reported a larger increase in outstanding mortgage loans than banks with more favorable deposit experience. This may reflect the fact that several of the banks that reported the largest increases in mortgage loans were heavily involved in the warehousing of mortgages. They may have been obligated to expand their mortgage portfolios because of advance commitments.

TABLE 1.—CHANGES IN DEPOSITS AND PRINCIPAL ASSET ITEMS, SAMPLE OF LARGE BANKS, JUNE 1955–DECEMBER 1956  
(Indexes, June 1955 = 100)

Item	Index (Dec. 1956) for Banks with		Ratio: Index for Banks with Favorable to Index for Those with Unfavorable Experience
	Unfavorable Deposit Experience <sup>a</sup>	Favorable Deposit Experience <sup>a</sup>	
Total deposits	103.3	114.2	110.6
Commercial and industrial loans	137.7	144.0	104.6
Mortgage loans	121.2	111.7	92.2
Consumer loans <sup>b</sup>	112.0	137.1	122.4
U. S. Government securities	71.8	93.7	130.5
Other securities	79.4	100.9	127.1
Number of banks	13	15	—

<sup>a</sup> Banks that lost deposits or showed a smaller gain than the average for banks in leading cities were included in the group with "unfavorable deposit experience." Those that showed a larger gain were included in the group with "favorable deposit experience."

<sup>b</sup> Data for "other" loans as classified in the weekly reporting member bank statement. Comprised predominantly of consumer loans.

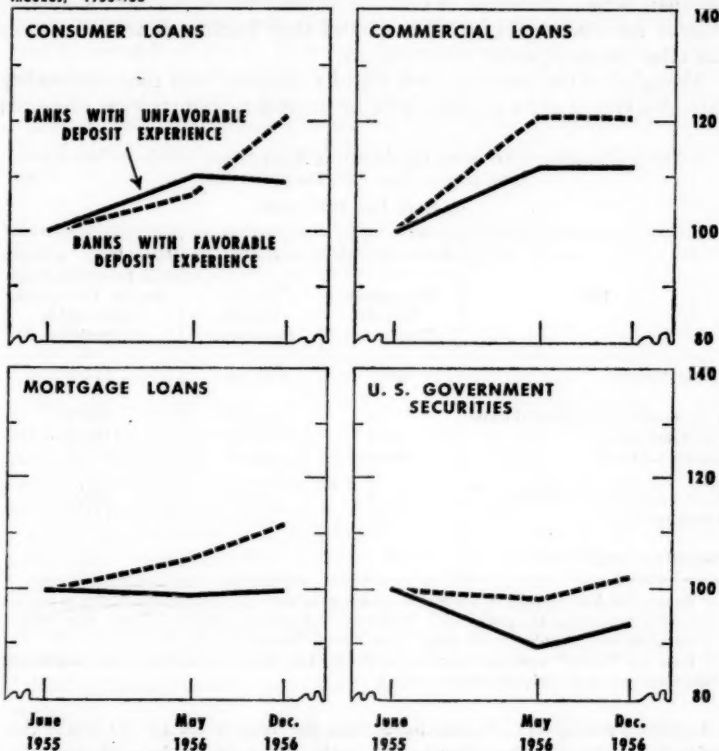
Nearly all of the banks with unfavorable deposit experience restricted their consumer loan activity. Only one of them reported a larger increase in consumer loans than the average for banks with better deposit experience. On the other hand, nearly all of the banks that gained deposits expanded their consumer loans more than the average expansion indicated by the banks that lost deposits.

A comparison of the changes in the principal items of loans and investment at banks with favorable deposit experience with those at banks with unfavorable experience gives a rough indication of the extent to which various types of loans and investments were restricted (see ratios in last column of Table 1). Consumer loans were more severely restricted than any other type of loan as indicated by the relatively high ratio of the index of banks with favorable ex-

CHART 2

## CHANGES IN LOANS AND SECURITIES - MEDIUM-SIZED BANKS

Index, 1955=100



Note: May was used as a dividing point for the entire period because reserve positions reached their tightest point (as indicated by the excess of borrowings over excess reserves) in that month.

perience to that of banks with unfavorable experience. Only investments in securities were more adversely affected.

## II. Experience of Medium-sized Banks

Sixteen of the sample of 35 medium-sized consumer lenders (the second sample) lost deposits or showed smaller than average gains. The combined total for the deposits of these 16 banks showed practically no change from mid-1955 to the end of 1956. This compared with an increase of about 15 per cent for the other 19 banks.

The restrictive effects of the loss of deposits at the 16 banks was reflected in every major type of loan and investment, as shown in Chart 2. Their consumer loans increased only about half as much as similar loans at the more fortunate banks. Expansion of commercial loans was smaller at these banks than at the other banks and they reduced their holdings of securities while the other banks expanded theirs slightly.

Nearly all of the banks that lost deposits restricted their consumer-lending activities. Only 2 of the 16 banks with unfavorable deposit experience reported

TABLE 2.—CHANGES IN DEPOSITS AND PRINCIPAL ASSET ITEMS, SAMPLE OF MEDIUM-SIZED BANKS, JUNE 1955–DECEMBER 1956

(Indexes, June 1955=100)

Item	Index (Dec. 1956) for Banks with		Ratio: Index for Banks with Favorable to Index for Those with Unfavorable Experience
	Unfavorable Deposit Experience <sup>a</sup>	Favorable Deposit Experience <sup>a</sup>	
Total deposits	100.2	113.4	113.2
Commercial and industrial loans	111.6	120.4	107.9
Mortgage loans	99.8	111.4	111.6
Consumer loans <sup>b</sup>	108.8	120.8	111.0
U. S. Government securities	93.4	102.0	109.2
Other securities	95.6	100.0	104.6
Number of banks	16	19	—

<sup>a</sup> Banks that lost deposits or showed a smaller gain than the average for banks in leading cities were included in the group with "unfavorable deposit experience." Those that showed a larger gain were included in the group with "favorable deposit experience."

<sup>b</sup> Data for "other" loans as classified in the weekly reporting member bank statement. Comprised predominantly of consumer loans.

a larger expansion in consumer loans than the average for the 19 banks that gained deposits. On the other hand, nearly all of the banks with favorable deposit experience expanded their consumer loans more than the average for banks that lost deposits.

As was the case with the larger banks, the medium-sized banks with unfavorable deposit experience restricted their consumer loans more severely than most other types of loans and investments (see ratios in last column of Table 2). There were some indications, however, that adjustments were not made as quickly in consumer loans as in other items. Banks with unfavorable deposit experience actually expanded their loans more rapidly than the other banks during the early part of the period studied. This suggests that there may be a time lag before adjustments are made in consumer-credit lending policies at banks that specialize in these loans.

### III. Concluding Observations

This study suggests that consumer credit is not uniquely insensitive to general credit conditions. It shows that banks under pressure to restrict credit limited their loans to consumers as well as their other loans and investments. It also shows that banks were responsive to market pressures and that strong market demands tended to be served. It seems likely that the reputation of consumer credit for insensitivity to general credit conditions is erroneously based on unusual demand forces associated with its growth. If, as many think, consumer credit has reached economic maturity, future demand forces for this type of credit may be less unusual and it may be more responsive to general credit conditions.

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### The Federal Personal Income Tax and the Incidence of Deductible Costs

Discussion of the impact of state and local taxes frequently fails to take account of the degree to which these taxes are passed on to the federal government in the form of increased deductions from taxable income under the federal income tax.<sup>1</sup> Even where such effects are noted, only the marginal rates of federal personal income tax are taken into account.

In practice, however, the federal personal income tax has an additional provision of major importance in any analysis of incidence. This provision is the one allowing a standard deduction of 10 per cent of adjusted gross income up to a maximum of \$1000 in place of the itemized deductions. For anyone using the standard deduction, changes in such things as state and local taxes, interest payments, or medical bills, cannot be passed on to the federal government unless they are so large as to induce him to itemize deductions.

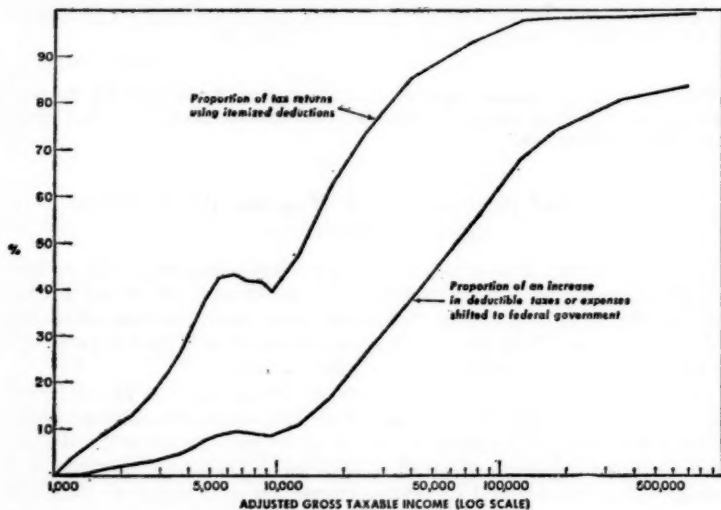
The upper line on Chart 1 shows that, except for a sag around \$10,000, there is a strong positive relationship between gross taxable income and the proportion of taxpayers in an income group who use itemized deductions. The lower line on the chart, based on the marginal tax rate for a family with two exemptions (married couple) shows an estimate of the proportion of any increase in deductible expenses of each group that would be passed on to the federal government if every family in that group had two people in it. For instance, the marginal tax rate around \$12,500 is 23 per cent, but only 47 per cent of returns itemize deductions, so that slightly over 10 per cent (23 times 47) of an increase in sales taxes, for instance, paid by this group would be recouped in lower federal income taxes. At \$125,000 adjusted gross income,

<sup>1</sup>For an excellent study that does take such effects into account, see *Report of the Governor's Minnesota Tax Study Committee*, Minneapolis 1956.

some 96.9 per cent itemize deductions and the marginal tax rate is 70, so that 68 per cent of an increase in state and local taxes paid by this group would be recouped in lower federal income taxes.

A more precise analysis would take account of the average number of exemptions per tax return in each income group, since it increases slightly as one goes up the income scale. However, an exemption amounts only to \$600 and this refinement would not appreciably change the marginal tax rates

CHART 1. SHIFTABILITY OF DEDUCTIBLE EXPENSES AT DIFFERENT INCOME LEVELS



SOURCE:

U. S. Treasury Department, Internal Revenue Service, *Individual Tax Returns For 1954*, Washington, D. C.: U. S. Gov't Printing Office, 1957 (Pub. No. 79). Table 1, p. 33 and Table 5, p. 48.

(Marginal tax rates from tax tables)

estimated here. One might also consider the extent to which changes in deductible expenses would change the proportion of people who itemize deductions; but if we are dealing with small marginal changes in a single item, this may well be an insignificant fraction.

Any study of the incidence of changes in state or local taxes, of interest rates, or of medical costs paid by individuals must therefore take account of three different factors: the initial incidence of the original cost for different income groups, the degree to which each group can avail itself of itemized deductions, and the marginal rate of federal income taxation for that income group.<sup>2</sup> It is clear that any increase in costs that are deductible for federal

<sup>2</sup> When one comes to specific taxes such as the property tax, of course, the initial incidence problem is itself complicated. One must ask whether an increase in taxes on rented property is passed on to the renter, and for owner-occupied properties must take account

income tax purposes, is likely to be regressive unless the increase itself is extremely progressive in order to offset the effects shown in Chart 1. This applies to increases in state and local taxes, in mortgage and instalment interest rates, in noninsurable medical costs or in medical insurance rates. The reverse is also true: any decrease in any of these things is quite progressive in impact.

Any progressive tax with provision for deductions of other (usually state and local) taxes, is much less progressive than it looks unless these other deductible taxes or expenses are also highly progressive. Particularly "at the margin," in discussing changes in state and local taxes, it is important to keep this in mind.

JAMES N. MORGAN\*

of the fact that as one goes up the income scale one finds an increasing proportion of people who own their homes (an increase from 30 to 90 per cent) and a declining ratio of house value to income. Also, the owners with mortgage interest and taxes to deduct are more likely to itemize deductions.

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### **Some Little-Understood Aspects of Korea's Monetary and Fiscal Systems: Comment**

Colin D. Campbell and Gordon Tullock in a recent issue of this *Review* discuss the difficulty of giving economic advice to foreign governments, illustrating the problem from American experience in the Republic of Korea from 1945 to 1954 [4]. However the institutional and political structure of the Korean economy has changed markedly since 1954. This paper will consider briefly those changes which, as of August 1957, would modify some of the findings of Campbell and Tullock.

The institutional framework of aid goods' distribution has been drastically revised [10, pp. 3-17].<sup>1</sup> The Korean government is no longer responsible for the sale of aid goods, and normally it does not set their market prices. The Korean government, through its various offices and through the Bank of Korea, administers the allocation and sale of aid dollars under the supervision of the International Cooperation Administration.

Aid expenditures may be broadly classified as "nonspecified end-user" and "specified end-user." In the nonspecified end-user portion of the program, specific quantities of dollars are allocated to the procurement of specific raw materials and consumer goods. The dollars in each category are then sold to the importers who offer the highest local currency downpayment against the purchase cost of the dollars; in case of equal bids buyers are selected by lot. The commodities imported may be sold in the open market at the prevailing market price. Nonspecified end-user dollar sales accounted for about

<sup>1</sup> A summary of the regulations governing the allocation of nonspecified end-user funds through the Bank of Korea was drafted by De Alessi and checked by Adams and Elmen-dorf of the Office of the Controller, UNC/OEC for Korea. The only change relevant to this paper that they noted as of August 29, 1957, was an increase in compulsory National Bonds sales from Hy¢/20 to Hy¢/30 per dollar purchased. The dollar allocation mechanism has been discussed in more detail by Louis De Alessi [5].

\$81 million in fiscal year 1956 and \$122.5 in fiscal year 1957, or 25 per cent and 37 per cent of the respective total defense-support programs [8, pp. 49-54, 77-81].

Dollars in the specified end-user portion of the program are used to support specific rehabilitation or development projects, and are sold to recipients administratively selected by joint United States-Republic of Korea agreement. Such recipients may be either private or government units, and they must use the dollars to import the capital goods and raw materials specified in the allocation authorization. These goods normally must be utilized by the importing unit, and cannot be sold in the market.

Dollars in both categories are sold at a basic rate of 500 hwan to the dollar. The hwan thus collected are used by the Korean government to finance some of its expenditures. Since the private sector buys dollars at a basic rate of Hw500:1 and sells the commodities imported or manufactured with imported materials at whatever price it can get, windfall profits are possible. Selling dollars in the open market to the highest bidder would eliminate such profits as well as increase government revenue, and thus exert some anti-inflationary pressure (on the basis of past experience it may be assumed that the additional revenue would finance expenditures that otherwise would be met through increased bank credit [9, p. 10]). Revision of the allocation mechanism is under study, with the aim of eliminating such profit opportunities.

Government enterprises are no longer expected to subsidize consumers by selling their output at prices lower than cost. The Monetary Board recently recommended that government enterprises be permitted to set prices that cover costs of production, that such enterprises be placed on a *laissez-faire* footing and that the participation of private capital be aggressively encouraged [1]. These recommendations are representative of current economic thought in Korea. On January 1, 1957, rail passenger rates were increased by 85 per cent, telephone and telegraph charges by 180 per cent, coal prices by 54 per cent, tobacco and salt prices by 50 per cent; accounting profits were anticipated in these areas [6]. Although rail freight rates were increased by 160 per cent, postal charges by 100 per cent, electric power generation rates by 150 per cent, and electric power distribution rates by 50 per cent, such services were expected to show a deficit; further rates increases were under consideration [6].

Tax increases now seem to be politically feasible, with an average increase in tax rates of 13 per cent taking effect January 1, 1957 [6]. This tax rise is probably inadequate as an anti-inflationary measure, since in fiscal year 1956 estimated revenues from all taxes and stamp duties financed only 21 per cent of the expenditures budgeted; however it should help to alleviate the pressure.

In 1956 consumption expenditures absorbed about 80 per cent and government expenditures 7 per cent of a gross national product estimated at \$1,833 million [7, pp. 34-35]. The same source estimated per capita consumption at \$67.

Private enterprise now plays a more important role in the economy than it did prior to 1955. By June 1957 about 80 per cent of all Japanese prop-

erties appropriated by the government had been sold to the public. Direct government control is largely limited to coal (about 60 per cent of the domestic output), tungsten, rail and air transportation, shipbuilding, electric power, tobacco, and salt. Government influence, exerted through a network of direct and indirect subsidies, appears to favor the growth of private business.

The Korean government still floats the bulk of its bond issues by means of compulsory sales. Such behavior is explicable, since the market rate of interest on a moderate-risk loan of Hy $\text{\$}$ 1 million is 8 per cent per month while government bonds yield a return of 5 per cent per year. In August 1957 all importers had to buy National Bonds to equal 25 per cent of the custom duty paid (an average of Hy $\text{\$}$ 30 per dollar spent). Importers of aid goods (staples excepted) had to buy additional bonds at the rate of Hy $\text{\$}$ 30 per dollar purchased [10, p. 11]. At that time the resale value of newly issued bonds was about 20 per cent of their face value, thus increasing the aid dollar purchase rate from 500:1 to about 550:1. Current black market rates were 990:1 for United States currency and 1,150:1 for export dollars.

The money supply, computed on the basis of the July 1955 definition now applied by the Bank of Korea, increased by 61 per cent in 1955 and by 29.3 per cent in 1956; the index of Seoul wholesale prices increased by 42.8 per cent in 1955 and by 42.6 per cent in 1956.<sup>2</sup> Koreans continued to use the hwan as a medium of exchange, as a unit of account, and, to some extent, as a store of value.

It is difficult to believe that the hwan should have been discarded as a unit of account [4, p. 349]. The Seoul wholesale price index or the United States dollar, suggested by Campbell and Tullock, would not have been practical alternatives. The Seoul wholesale price index appears subject to erratic fluctuations [3, pp. 17-18],<sup>3</sup> and the "real" value of the hwan in dollars is difficult if not impossible to obtain at a given historical time, let alone consistently over time. Even if an adequate unit of account were selected and an adequate method of computing the rate of conversion were evolved, that rate would have to be adjusted at least weekly. The difficulty of having all government and business units adhere to this procedure would seem to exceed the advantages, if any, that might be derived from its adoption.

Campbell and Tullock assert that the Korean economy would have benefited from the import of an alternative store of value, such as foreign currency or precious metals [4, p. 349]. It is not clear that the social cost of hoarding dollars or gold is necessarily less than that of hoarding goods. The alternative propensities to hoard would seem to be one of several relevant factors calling for careful analysis.

The Korean standard of living has improved since 1953, and present conditions indicate that the current rate of economic development will be maintained in the future. However Korea still has serious economic problems to

<sup>2</sup> These percentages represent increases from the end of the previous year [2], and extend Table I in Campbell and Tullock [4, p. 340].

<sup>3</sup> Comments concerning weaknesses in the statistical reports of the Bank of Korea stem from an awareness of the difficulties involved in collecting the data, and do not reflect discredit upon officials and staff members of the BOK.

solve before it can achieve that rate of self-sustaining growth necessary to foster a substantial and continuing increase in its real per capita output of good and services.

LOUIS DE ALESSI\*

ROBERT EVANS\*

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#### Some Little-Understood Aspects of Korea's Monetary and Fiscal Systems: Comment

Colin D. Campbell and Gordon Tullock's article, "Some Little-Understood Aspects of Korea's Monetary and Fiscal Systems," in the June 1957 issue of the *Review* is a welcome contribution because it draws attention to the peculiar problems of the war-torn economy of Korea. A few words of caution are nevertheless in order.

This relates to their discussion of "nonbudgetary revenues" of individual government agencies of Korea, a discussion which involves some, no doubt unintentional, exaggeration. According to the authors, the Korean government has maintained the prices of aid goods at a level materially lower than prevailing market prices for the dual purpose of enhancing government popularity with end-users, and of using that part of the proceeds of the aid commodities that represents the spread between the market and official prices

to meet expenditures of individual government agencies. The illustrations which the authors give however—specifically those of gasoline and fertilizer—are not cases that can substantiate the authors' assertions that the Korean government pursued the policies described by them.

For instance, all of the gasoline and other petroleum products required for the civil economy are procured by the United States Army and turned over for distribution to the Korea Oil Storage Company, jointly operated by Caltex, Socony Vacuum, and the Shell Company, which retails the products through its authorized dealers. Decision on the kinds and quantities to be procured, on their distribution, and on their pricing are made by the U. S. aid authorities and the Korean government, acting jointly through the Combined Economic Board.

Every phase of the fertilizer program, comprising procurement, inland transportation, and distribution, is also conducted under the joint supervision of the Korean government and the U. S. aid agency in Korea. And since there is a strict requirement of joint agreement between the Korean and United States government authorities on every important aspect of the fertilizer program, it simply is not true that the Korean government can or does act unilaterally in any material way to "produce revenue for individual bureaus."<sup>1</sup> Indeed the pricing of fertilizer is not only subject to this joint control, but to the approval of the Korean National Assembly as well.

There probably were some irregularities among some officials in times of product scarcity resulting from poorly coordinated programs. But they were undoubtedly much less prevalent than Campbell and Tullock suggested; and the situation in any event has greatly improved as government operations have increased in efficiency.

I am nevertheless anxious to add that, despite my rejection of certain portions of the article, there is no intention to deprecate the authors' approach to the problems of the Korean economy and its administration.

SEI-YOUNG PARK\*

<sup>1</sup>I may be excused a brief personal reference. I myself never encountered, during my four years' tour of duty with the Korean government, 1950-1954, the alleged unlawful practices of securing funds for expenditures from sources outside the budget authorized by the national legislature.

\*Subsequent to the submission of this paper the author has joined the economics staff of the International Bank for Reconstruction and Development, Washington, D.C.

### Reply

Although some changes in economic conditions in South Korea undoubtedly have occurred since 1954, we are impressed by the similarity of the comments made by De Alessi and Evans to those made by a number of economists prior to 1954. The relationship of the aid program to the budget, the development of free enterprise in South Korea, and the "windfall profits" related to the aid program were all described in much the same terms before 1954. Our belief is that Korean institutions are more complicated than such descriptions indicate and that they cannot be understood properly in terms of their counterparts in the United States.

The suggestion that Koreans discard their depreciating hwan as a unit of account is concerned with the important accounting problems created by a continuously depreciating currency. In South Korea accounting has been almost completely useless as a basis for making management decisions because the values of purchases and sales have varied with the date of the transactions. Our suggestion had in mind an educational effort to acquaint Koreans with the advantages of using alternative accounting units. We would be opposed to requiring all government agencies and business firms to adhere to any particular unit of account. Business firms should be free to adopt or reject alternative units of account in order that they change over to new accounting procedures only if such procedures appear advantageous. A problem of enforcement, which De Alessi and Evans believe is a weakness of our suggestion, would not arise. Conversion factors relating current market prices to a unit of account have been used successfully in countries with depreciating currencies [1] [2, pp. 92-93] [3]. There is no reason to believe that such arrangements are impractical.

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#### An Estimate of the Tax Element in Soviet Bonds: Comment

Professor Franklyn Holzman's discussion of the tax element in Soviet bonds [4] contains two important errors, one in mathematics and one concerning bond redemption schedules, which are responsible for an unsatisfactory appraisal of the 1957 Soviet bond freeze. The purposes of the present note are (1) to point out these errors and the weakness of the tax element approach in an analysis of Soviet bond policy and (2) to offer an alternative explanation of the Soviet bond freeze measures.<sup>1</sup>

##### I. The Tax Element in Soviet Bonds

Holzman's conclusion that the tax element in Soviet bonds, as he defines it,<sup>2</sup> declined sharply or was eliminated in the postwar period results from an

<sup>1</sup> This note is based in part on sources which would not have been available to Holzman during the preparation of his article early in 1957.

<sup>2</sup> The tax element in the compulsory sale of a bond is defined as follows [4, p. 393]:

$$T = V_t - \frac{V_0}{P_t/P_0}, \text{ when}$$

error in his calculations. He states [4, p. 395] that the tax element in an issue with a 2 per cent official rate and a 15-year effective term, under the assumption of consumer expectations of a 50 per cent decline in retail prices over the term of the loan, would be 5 per cent when the "market" rate is 10 per cent, and 39 per cent when the market rate is 15 per cent. Under these assumptions, the tax element works out to 36 and 67 per cent, not 5 and 39 per cent, respectively.

Moreover, if it is assumed that in the past few years Soviet consumers expected a continuation of the retail price stability which has, on the whole, prevailed since 1954 [11, p. 232], the tax element according to Holzman's formula would be still higher. If a 2 per cent official rate, a 15-year effective term, and no expectation of price changes are assumed, the tax element would be 68 per cent with a 10 per cent market rate, and 83 per cent with a 15 per cent market rate. Under either set of assumptions regarding price-change expectations, the decline in the tax element from the levels estimated for the 1930's by Holzman [4, p. 394] is not significant enough to warrant his conclusion that such a decline was responsible for the termination of "mass-subscription" bond issues.

In view of the extremely crude assumptions which must be made concerning consumer price expectations and the market rate of interest, as Holzman defines it, the meaningfulness of the figures introduced into his formula and the usefulness of the tax element approach in interpreting Soviet fiscal policy are questionable. For example, Holzman's estimate of a 15 or 20 per cent market rate in the 1930's is based on the doubtful assumption [4, p. 393] that in 1927 the Soviet population did not expect either further inflation or a possible future bond conversion. On the contrary, the experience of the Soviet population with severe and prolonged inflation and currency conversions during and after the first world war [2, *passim*] would have led it to anticipate or at least suspect further inflation and conversions. The prevalence of such expectations would suggest even higher market rates for the 1930's in Holzman's formula, although it does not appear very fruitful to speculate upon what these hypothetical market rates might be.

In his account of the features of Soviet bond issues [4, p. 391], Holzman overlooks one characteristic of these issues, and this oversight contributes to his incorrect interpretation of the 1957 bond freeze.<sup>3</sup> Holzman incorrectly states that holders of nonprize-winning bonds did not recover their principal until the 20-year period of the issue had elapsed and that retirements of such bonds were not scheduled to begin until 1968. In fact, in addition to the semiannual "prize" drawings to select prize-winning bonds, separate nonprize or "retirement" drawings were held annually to redeem at face value a portion

$T$  is the absolute amount of tax;  $V_i$  is the present value of the bond at its nominal or stated rate of interest;  $V_m$  is the present value of the bond at the market rate of interest (defined as the rate at which the Soviet government could just sell to the population on a voluntary basis the specified flotation of bonds) on the assumption that the purchaser expects no change in consumers' goods prices over the life of the bond; and  $P_t/P_0$  is the price index of consumers' goods which the bondholder, at date of purchase, expects to prevail in the year when the bond matures.

<sup>3</sup> This oversight occurs also in his earlier study of Soviet taxation [5, pp. 202-3].

of the nonprize-winning bonds.<sup>4</sup> Prize drawings on a given issue began in the following year, whereas retirement drawings did not begin until the fifth year of the life of an issue. Thus, on the 1947 issue, prize drawings began in 1948 and retirement drawings in 1952; on the 1948 issue, respectively in 1949 and 1953; etc. Furthermore, the size of the retirement drawings was not the same throughout the 5th-20th years of the issue's life; instead, it increased in the 11th-15th and 16th-20th years over the level of retirements scheduled for the preceding 5-year period [6] [7] [3, pp. 60-61]. The addition each year of both new prize drawings and new retirement drawings to the drawings already being held therefore caused a steady and substantial annual increase in debt service during the early 1950's [12, p. 25]. An even greater annual increase in service was to be expected during the late 1950's and 1960's, when retirement drawings on the early postwar issues were scheduled to rise as these issues reached first their 11th and then their 16th years.

## II. *The 1957 Bond Freeze*

Holzman evaluates the 1957 bond freeze<sup>5</sup> as follows [4, p. 396]:

The discontinuance of sales of "mass-subscription" bonds is easy to understand in light of the decline or elimination of the tax element in the bonds. The (what appears to be a) default is a drastic step and is hard to understand at the present time in the absence of overt crisis and in view of the fact that the service burden is slight and will continue to be slight until 1968 when the first of the bonds outstanding, aside from lottery winners' bonds, are due for retirement.

The discussion in the preceding section has shown the deficiencies of this appraisal. First, the tax element, as Holzman defines it, did not decline significantly but remained quite high. Second, retirements of nonprize-winning bonds began in 1952 and contributed to the sharp increase in debt service in the early 1950's and the further increase to be anticipated thereafter.

A more likely explanation of the bond freeze is that given in Khrushchev's original proposal [8] and in subsequent official statements [9] [12, p. 24], namely, that annual debt service (in the form of prizes, redemptions, and administrative costs) was absorbing a rapidly increasing share of annual loan revenue, thereby reducing both the gain to the treasury in the form of net revenue and the net anti-inflationary impact of the bond program. As the effectiveness of the bond program diminished, it became less attractive to the Soviet government, which decided to discard it in favor of other sources of revenue. Thus, in the 1958 budget the loss of net bond revenue was more than offset by the expected increase in turnover (excise) tax revenues [10].

<sup>4</sup> Thus, even for the bondholder who did not win a prize there was an element of chance—the uncertainty as to how soon his bond would be redeemed at face value.

<sup>5</sup> The freeze included (1) postponement of service on outstanding mass-subscription issues until 1977, when these issues are supposed to be consolidated and retired over a 20-year period; (2) flotation in 1957 of an issue less than half the size of the 1956 issue and redemption of the 1957 issue in 1958-62; (3) elimination of new flotations after 1957; and (4) continuation of sales of the voluntarily purchased "cash" or "freely circulating" bonds [9].

Another objective of the bond freeze, not acknowledged by the Soviet regime, may have been the desire to increase the monetary incentives, and thereby the productivity, of the labor force through a simultaneous increase in disposable earned income and elimination of unearned income. Because bond subscriptions were compulsory, progressive,\* and deducted from workers' pay, they had the same disincentive effect as the personal income tax. Their elimination should in turn have the same incentive effect as a cut in personal income taxes, which also has become effective in 1958 [10]. At the same time, the importance of earned income to the Soviet household has increased as a result of the loss of unearned income in the form of bond prizes and redemptions, on which every Soviet household must have counted to some extent because of the virtual universality of bond subscriptions. Although the impact of an increase in disposable income is of course dependent upon the availability of consumer goods and their price level, it is likely that the combined elimination of new subscriptions and termination of service payments on old issues had a favorable (from the viewpoint of the regime) effect on worker incentives.

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\*Subscription requirements were defined in terms of the number of weeks' wages to be subscribed, and the number required increased for successively higher wage brackets.

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#### Reply

Mr. Bornstein is correct in showing that I made a computational error in estimating the tax element in Soviet bonds for the postwar years, an error which led me to underestimate the tax element for these years. However, on

my assumption that Soviet prices will continue to fall, the tax element for the postwar period turns out to be considerably less than that for the prewar period, and I still believe that this was probably an important factor in the decision to "freeze" and "discontinue" the bond sales. A 100-ruble bond bought in 1930 had, by 1940, less than 20 rubles of purchasing power in 1940 prices; a 100-ruble bond bought in 1948, had, by 1958, about 200 rubles of purchasing power in 1958 prices.

Now Bornstein argues that prices have been relatively stable since 1954, and therefore from the point of view of the bondholder the tax element is still fairly high (though I would argue not as high as in the 'thirties). The state's decision to discontinue the sale of bonds, however, is not based on bondholders' expectations but rather on its own plans regarding the consumer-goods price level.<sup>1</sup> I would anticipate that in the future the Soviets will continue to use price cuts as a means of passing on increases in the standard of living while keeping wages and other incomes roughly stable. This has been their avowed policy since 1928 and has been implemented since 1948 when control over incomes made price cuts possible. I regard the cessation of price cuts since 1954 as temporary in nature due to: the stepped-up industrialization when Khrushchev first took over; the numerous special measures which have been taken in the past few years to adjust relative incomes (increase in payments to collective farmers, increase in pensions, increase in minimum wages, etc.); the stepped-up housing program, a form of consumer service not reflected in the price indices; and so forth.<sup>2</sup>

Finally, I agree with Bornstein that the "official" argument concerning the freeze and discontinuation has merit: that with repayments plus debt service gradually overtaking receipts, the bond program had become less attractive to the planners. But I think this argument is much more convincing when viewed in the perspective of the change from an inflationary to a deflationary economy with its implications for the "tax element." I do not believe the Soviets would have repudiated (in effect) 260 billion rubles in bonds, equal to about one-half year's personal income, just because their net receipts from sales of bonds were declining. This is not the kind of action that a government, even as centralized and powerful as the USSR, contemplates lightly. The big problem is that repayments today are worth so much more in *real* terms than the original receipts, whereas in the 'thirties they were worth so much less.

If inflation were still rampant: (1) It would still pay the Soviets to sell bonds today paying back a fraction of their real value sometime in the future. Bonds, unlike taxes, are an intertemporal fiscal weapon and it makes sense to assess their utility over time as well as in relation to problems of the moment.

<sup>1</sup> The major purpose of my original note was to estimate the tax element from the point of view of the bondholder. As the note was about to go to press, the Soviets initiated their freeze. My brief addendum on the freeze which is a major target of Bornstein's, was unfortunately misleading on this point.

<sup>2</sup> This point was made in a letter to *Problems of Communism* accepted for publication in January 1958. In Moscow in May 1958, two leading Soviet financial specialists, Bachurin and D'iachenko, expressed the same opinion to me in private conversation.

(2) The 260 billion rubles worth of bonds instead of equaling one-half year's annual income would have been worth much less. Similarly the annual repayments would have constituted much less of a *real* burden than they actually are. (3) Receipts would remain ahead of repayments plus debt service for a longer time, perhaps forever, since sales of bonds would increase each year along with wages, as was the case in the 'thirties. It is difficult to increase bond sales with incomes roughly stabilized.

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## BOOK REVIEWS

### General Economics; Methodology

*Three Essays on the State of Economic Science.* By TJALLING C. KOOPMANS.  
New York: McGraw-Hill, 1957. Pp. xi, 231. \$6.50.

In this important new book Professor Koopmans strives to achieve three major objectives: First, to make available to the nonmathematical economist the achievements in a certain branch of mathematical economics, namely the branch dealing with the properties of competitive equilibrium, both descriptively and normatively, and the closely related problem of efficient allocation of resources through a price system. Second, to present his methodological credo on the construction of knowledge in economics. Third, to display the effectiveness of the "new" mathematics, linear algebra and point set topology, in the formulation and solution of the economist's problems.

The first essay, entitled "Allocation of Resources and the Price System," is by far the most important and the most difficult of the three. In it Koopmans attempts to bring together within a single conceptual structure the variety of contributions to such topics as the decentralization of economic decisions, the existence of competitive equilibrium, the connection between competitive equilibrium and Pareto optimality, activity analysis, linear programming, and input-output studies. Despite the fact that this essay is intended as a summary report or survey of a wide variety of studies, it is so successful in developing the connections among seemingly different kinds of undertakings, that it should be viewed as an eminently creative synthesis. It must be conceded, however, that despite the great efforts of the author to simplify the argument and present it in terms as nontechnical as is consistent with the nature of the subject matter, the going is hard. The mythical "average economist" may expect to get the flavor of the argument, but should not really expect to understand it fully, unless he is prepared to acquaint himself with the mathematical tools needed.

This essay offers an excellent discussion of the conditions under which decentralization through a price system is feasible. However, its main limitation, and by implication the limitation of the literature from which it draws, is the absence of any discussion of the purely organizational as against the technological aspects of the problem of decentralization. The theoretical framework of activity analysis leaves the question of the optimum number of productive units in an economy without a satisfactory answer. Koopmans recognizes this and proposes that a solution be sought through the introduction of strictly convex production sets (decreasing economies to scale) which are associated with indivisible resources. The whole flavor of this proposal is technological and thus the opportunity is missed of expanding the research horizon to include strictly organizational considerations in the theory of the size of the firm.

The first essay also contains an argument in favor of employing the powerful techniques of point set topology and linear algebra in lieu of the "myopic" technique of the calculus with its necessary emphasis on local maxima and minima and local solutions. The argument is well taken, provided that it is kept in mind that, for a wide range of problems in comparative statics and dynamics, it is convenient to fall back on the techniques of "old-fashioned" mathematics.

In the second essay, "On the Construction of Economic Knowledge," Koopmans forcefully argues that economics as a scientific enterprise (rather than as an art) requires a clear separation between the logical and the factual sources of our knowledge. This is best achieved by a fuller use of the postulational method which is described briefly but lucidly by the author. The explicit methodological argument in this essay is generally consistent with the prevailing views, but its tone along with the author's use of the postulational method may be somewhat misleading. Koopmans argues correctly that the process of reasoning from premises to conclusions (according to the rules of logic or mathematics) within a given postulational system is fully independent of any factual knowledge. He proceeds to argue, however, that as soon as we provide the terms of a postulational system with a descriptive interpretation (thus using the verbiage of the economist rather than the logician or mathematician), the system assumes relevance and economic meaning. Indeed Koopmans practices what he preaches because in the first essay he distinguishes between descriptively uninterpreted and descriptively interpreted systems, by drawing a sharp distinction between "theorems" (mathematical statements) and "propositions" (economic statements).

This view is not entirely correct. The assignment of a descriptive interpretation to the terms of a postulational system does not necessarily turn it into an applied (as distinguished from pure mathematical) system. A system may remain pure or analytic despite a descriptive interpretation of its terms. Consider, for instance, the sentence: "If the cat is black, then the cat is black." An examination of the "propositions" presented by Koopmans in the first essay establishes that they are all analytic or logically necessary. He accomplishes this by deriving theorems (which he calls "propositions") in which the postulates are asserted to imply the conclusions. If the class of statements B are conclusions from a class of statements A, then the statement "A implies B" is analytic independently of the factual content of A and B taken separately.

It should be stressed that nothing prevents us from deriving some factual statements from the postulational system presented by Koopmans in his first essay. It is merely asserted here that he did not choose to do so. Furthermore, the fact that he provides the terms with a descriptive interpretation does not turn his "propositions" into factual statements and prevents him, therefore, from using them in the manner in which he claims they can be used, namely as empirically refutable or confirmable hypotheses. (Interestingly enough the "propositions" of the first essay contain the essence of what goes under the name of "welfare economics." In the opinion of this reviewer this is no accident. The branch of economics known as "welfare economics" seems to be a

collection of the interesting analytic statements which may be constructed from the body of economic theory.)

The third essay on "The Interaction of Tools and Problems in Economics" is the least interesting of the three. It is a survey of the variety of new tools and techniques that have developed in recent years, in the light of the needs of the discipline. The sample survey, statistical inference, computing techniques, and the "new" mathematics, all receive some attention and brief treatment.

Looking at the book as a whole one cannot help but admire the elegance and high technical competence with which it has been written. Koopmans' primary objective, however, was to write a book that would reduce the isolation of the mathematical economist from his nonmathematical colleague. On this score the book is only moderately successful—not because its execution is defective, but rather because the basic argument requires a degree of mathematical sophistication which is typically possessed only by those who have dealt extensively with mathematical methods.

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*Principles of Economic Policy.* By KENNETH E. BOULDING. Englewood Cliffs, N.J.: Prentice-Hall, 1958. Pp. vii, 440. \$7.95.

This latest volume by Professor Boulding was begun as a revision of his *The Economics of Peace* which was published in 1945. As he points out in the preface, however, it has developed into an almost completely new book and, while his preoccupation with war and peace remains in evidence, the book represents an attempt to analyze economic policy in general.

As the title suggests, this is not a book of techniques but rather an exposition of the principles involved in economic policy-making. In fact, Boulding goes so far as to claim it is an introduction to economic principles. In a way this is true, but certainly not in any ordinary sense. It is, on the one hand, actually less than this, for some fundamental economic concepts are given no explicit attention. On the other, it is considerably more because the treatment of policy has forced Boulding beyond the boundaries of pure economics and into the other social sciences and ethics. In this respect the book is difficult to classify. However, while there are points at which the full significance of Boulding's words can be appreciated only by persons of some degree of economic sophistication, its level is generally such that it can be profitably read by intelligent laymen and beginning students.

The book is divided, unequally, into two parts. There is first an analysis of economic policy as such. This section, somewhat the smaller of the two, emphasizes the objectives of economic actions and institutions, indicating the role of the economist and his tools of analysis in the drawing of policy. Following the opening statement of the nature of policy and the uses of the tools of economic science for policy purposes—which are very clearly enunciated—there is an extended development of each of Boulding's several objectives of policy. Here the general conditions for each to be achieved are set forth or, as is more frequently the case, the conditions which impede the achievement

of each objective are set forth. The concluding chapter of this first part of the book is a useful discussion of ends and means which, in addition to a treatment of the rudimentary ideas of conflict and complementarity of objectives, points up the tendencies to confuse means with ends and to come to regard social and economic institutions as ends in themselves. The role of involvement and loyalty in the dynamics of social organization is also considered, and Boulding shows how different institutions beget different degrees of loyalty from the public and how such loyalty while providing social stability may also be costly. This chapter is among the best of the book.

Much may also be said for his forthrightness in coming to grips with the relationship between ethics and economic policy in the final chapter of the book. It is indeed refreshing to read an economist who, while he has earlier stated that science is concerned with means not ends and has suggested that the critique of ends is more in the province of philosophy than science, frankly acknowledges that the operation of the economy may produce "ideals and value systems which are incompatible" and that these conflicts may challenge the survival of the economy. Boulding sees that the economist in making policy must do more than simply take values and ideals as a part of the empirical baggage with which he is confronted. Where social irresponsibility prevails, for example, policy may have little significance. The limits on policy are set by the organizational structure of society, and this structure, in turn, rests upon the value systems of the society's members.

Despite the obviously gratifying features of those portions of the book dealing with ends and with ethics, the reader may finish them feeling unsatisfied. The willingness to accept for consideration the problems which are associated with ethics, realistic and important though they are, infinitely complicates the task of offering a well-rounded body of principles for economic policy. Boulding recognizes that no single objective of policy is adequate; that policy must achieve a balance among a multiple of objectives.

Since policies imply particular objectives, policy-making, if it is not an art but a science as Boulding claims, is normative rather than positive in nature. It will not do to count one system's fruits and costs, therefore, in terms of the objectives of another. Yet Boulding implicitly lapses into this error, using his list of objectives as a standard for economic policy wherever applied. Thus the exact significance of the book's conclusions about the costs and fruits of communism as judged by noncommunist objectives is uncertain. A similar problem arises if we try to apply essentially normative principles of policy to the large body of "uncommitted" underdeveloped countries of the world. These countries are different from us and probably wish to remain so. No doubt all systems have points of similarity where objectives coincide, but in the development of policy it would appear most appropriate to spend much effort in discerning the full range of each society's goals before the policy "principles" are established.

Economic analysis can block out ranges of impossible action and establish degrees of probability or improbability as guides for building policy, as Boulding points out. These are universal propositions, at least in part, but they are grossly inadequate for policy-making unless supported by a set of

objectives. The scope of Boulding's principles of policy is thus limited in large measure to societies similar to our own. But the book does not make this clear.

Turning to what is quantitatively the larger part of the book, Boulding's earlier discussion of objectives proves helpful within the boundaries of our own social organization. Here he presents a canvass of the problem areas for policy. Attention is given successively to fiscal, monetary, income maintenance, foreign trade, antitrust, agriculture, and labor policies and finally there is a consideration of the economics of war and peace. While this survey has something to offer the layman or beginning student, it will prove less interesting to the professional economist than the earlier section of the book.

Several things work against this wide sweep of policy areas. Each problem area is presented in the context of its history and, to be appropriate for the layman, some of the fundamentals of economics are enunciated. Almost inevitably, because of space limitations, the treatment is less than exhaustive and at some points the analysis will not prove compelling to professional readers even when they can agree generally with the policy conclusions. From this part of the book one gains a feeling of incompleteness. The suspicion arises that what is a chapter should in each case be a book, for the problems addressed are not a few of the technical questions of these fields but those of grandest scope.

Finally, one additional characteristic of this work which is disturbing is the use of language. Certain terms have come to have fairly precise and standard meanings in the field. There are at times advantages to be gained from redefinition when this is exercised with care; but when it is indiscriminate the language can become a jungle. When we find competition defined in this book as the ability of the superior to displace the inferior, the whole scope of the term shifts. The forceful displacement of the peasants by collective farms in Russia is cited as competition along with the suppression of "inferior" minority groups by a totalitarian government. The term "transactions" becomes synonymous with any kind of change. Even the liberal interpretation of this term made by John R. Commons never approached such scope. Distortion of generally accepted meanings for important terms such as these can only be justified by extraordinary analytic advantage.

Yet tempering these critical remarks is the fact that Boulding's approach to policy is made with the careful use of the economist's tools. For the most part he does not point to particular policies except to draw out their implications. He does not suggest that policy can advocate specific "optimum" conditions. Instead he uses his tools to block out certain areas as unfruitful for the achievement of particular policy goals. There is no doctrinaire preaching of specific policies, therefore, but a systematic circumscribing of the ranges within which workable policy must fall. In this sense an approach to policy-making is set forth that should prove educational to all. This is the broad message of the book and it is a worthy message.

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**Price and Allocation Theory; Income and Employment Theory;  
Related Empirical Studies; History of Economic Thought**

*Linear Programming and Economic Analysis.* By ROBERT DORFMAN, PAUL A. SAMUELSON, and ROBERT M. SOLOW. New York: McGraw-Hill, 1958. Pp. ix, 527. \$10.

(As an experiment or gamble, your editor assigned this essentially mathematical volume to a merely semimathematical reviewer. A semimathematical reviewer might appreciate some finite proportion of the contents before being overwhelmed or exasperated by mathematics beyond his ken. At the same time he might speak his piece without vested interest in any mathematical or econometric school or cult. Whether or not such a recipe entered the editor's mind, it is both a logical and an interesting recipe on first impression. But the proof of the pudding is in the eating, and the proof of the review is in the contents.)

*Linear Programming and Economics Analysis* is in a very real sense Volume II of Samuelson's *Foundations of Economic Analysis*, largely written twenty years ago. As in the *Foundations*, a common set of mathematical tools is shown to underlie what seem at first widely disparate branches of economic thought—in this case linear programming, input-output analysis, capital theory, general equilibrium theory, welfare economics, and the theory of games. This time, however, Samuelson profits from two full partners, each distinguished in his own right. Their shares were (we surmised at first) concentrated most particularly in the fields of their previous contributions: Dorfman's in linear programming for the individual firm (Chapters 6-8) and Solow's in the treatment of Leontief models and capital theory (Chapters 9-12), but we have been assured these surmises were wrong. The book is a compound, not a mixture.

The essential difference between the linear-programming or linear-economics approach and the continuous-function or differential-calculus approach to a wide range of production, allocation, and welfare problems can be put in literary terms: The former can locate in practice the closest feasible approaches (in a discontinuous and otherwise imperfect world) to optimum positions which the latter attains only in theory. Traces of concern for this sort of concreteness and practicality were found in the *Foundations* (for example, in the handling of discontinuities at pp. 46-52); here they dominate the entire volume. The something new which has been added, however, is the technique for actual location of optimal positions in specific cases. And the very fact of something new belies Boulding's famous review article on the *Foundations* (*Jour. Pol. Econ.*, June 1948, 61, 187-99) forecasting that only sterile formalism would be added to *Foundations* which formed in themselves the end of one particular blind alley in the history of economic thought.

But architectonics concern most potential readers less than mundane matters: (1) "What mean such mysteries to me, Who am untrained in indices and surds?" (2) Is this perhaps a text for my course or a focus for my seminar? (3) Will it forecast me the markets, or bend tribunals and legislatures to my bidding?

Question 1a. Neophytes (including sophomores, laymen, and the superannuated) can profit from Chapters 1, 2, and most of 6 (linear programming proper), not to mention the first halves of Chapters 9 (input-output), 14 (welfare economics), and 15 (game theory). For much more they had better seek foundation grants to support them while working through the algebra of sets and matrices. (The Dorfman-Samuelson-Solow appendix on matrices should be touched only *after* the reader has mastered, say, the similar appendix in Klein's *Econometrics*.)

Question 1b. Other volumes are better fitted to conveying linear programming *a la* cookbook. Charnes, Cooper, and Henderson's *Introduction to Linear Programming*, for example, includes many more intermediate steps than this volume; it also pays more attention to computational mechanics. Furthermore (now transcending Fanny Farmer) it spends more time explaining the meanings of the complex parts of the simplex tableau. On the other hand, Dorfman, Samuelson, and Solow have chosen their illustrative examples with much greater felicity.

Question 2. We find the customary disclaimer: "This book is intended not as a text but as a general exposition," although "it has been successfully used for graduate classes in economics." Given the price tag and the demise of the "G. I. Bill," teachers below the seminar level would do well to rely on library copies and hope for a cheaper abridgement covering primarily the material listed above under (1a).

Question 3. No substitutes here, alas, for the sound judgment, the inside information, the silver tongue, or the campaign contribution. The seeker for stupidity insurance must likewise go elsewhere.

Not professing encyclopedism, this volume reflects the special interests and opinions of its three authors. Certain of these may irritate other authorities. Modigliani and his Carnegie co-workers may not approve the Dorfman-Samuelson-Solow neglect of their schemes of quadratic programming in Chapter 8. Leontief and his Harvard group may find the criticisms of input-output projections somewhat severe. Skepticism as to the applicability of game theory to economic analysis may not be seconded by Morgenstern and his associates at Princeton. (This reviewer would tend to sympathize more deeply with the Carnegie complaints than with the others.)

It is sometimes thought misleading to derive conclusions sounding like policy prescriptions or theoretical innovations on the basis of restrictive assumptions "in fine print" or otherwise concealed from the casual reader. This book offers three examples in its later chapters, all elegant derivations from the mathematical viewpoint. In Chapter 12 the competitive market is shown to provide optimal, or at least efficient, patterns of capital accumulation and economic growth through time—provided all persons foresee the indefinite future with absolute certainty, live forever, enjoy transmigration of souls, and/or treat their descendants' interests as their own. In Chapter 13 is demonstrated the existence of an unique and nonnegative solution for the Walras-Cassel general equilibrium model (fixed production coefficients, fixed stocks of resources, no intermediate products, an' a' that), provided we permit structural unemployment of some of our resources. Finally (Chapter 14) a

fundamental theorem of welfare economics is derived, equating free competition with Pareto welfare optima—a new equilibrium and a new Pareto optimum for every change in the initial distribution of assets. The welfare objections to excise taxation are also restated here—without warning that similar objections apply to a great many other types of taxes, once leisure is recognized as a commodity.

M. BRONFENBRENNER

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### **Economic History; Economic Development; National Economies**

*Trade and Market in the Early Empires: Economics in History and Theory.*

Edited by KARL POLANYI, CONRAD M. ARENSBERG and HARRY W. PEARSON. Glencoe, Ill.: The Free Press, 1957. Pp. xviii, 382. \$6.00.

This book is a collection of essays growing out of research at Columbia University on the origins of economic institutions and the economic aspects of institutional growth. Most of the contributors have been members of the faculty or graduate students at Columbia in one or another of the social sciences. Some of the essays discuss aspects of early or primitive economies (Babylonia, early Assyria, Mesopotamia, Aztec and Mayan civilizations, the Guinea Coast, the Berber highlands, the Indian village). Others are of a more general quality ("The Place of Economics in Societies," "The Economy as Instituted Process," "Economic Theory Misplaced: Livelihood in Primitive Society," "The Market in Theory and History").

The burden of the book is summarized in an introductory note:

Most of us . . . think that the hallmark of the economy is the market. . . . What is to be done, though, when it appears that some economies have operated on altogether different principles. . . . The conceptual problem arises in marketless economies where there is no "economizing," i.e., no institutional framework to compel the individual to "rational" and "efficient" economic activity, or "optimum" allocation of his resources. . . . In that case the economy would not be subject to economic analysis since this presumes economizing behavior with supporting institutional paraphernalia, e.g., price-making markets, all-purpose money and market trade. . . . The aim [of the book] is not to reject economic analysis, but to set its historical and institutional limitations, namely, to the economies where price-making markets have sway.

If one examines economies empirically, it is said, three patterns of economic behavior are encountered. These are "reciprocity, redistribution, and exchange."

Reciprocity denotes movements between correlative points of symmetrical groupings; redistribution designates appropriational movements toward a center and out of it again; exchange refers to vice-versa movements taking place as between "hands" under a market system.

Formal economics, or economic theory, or economic analysis, say the authors, has relevance only to the final case in this trilogy. But only a brief period

in the whole history of human society, and only a few societies in the universe of all societies have been characterized by "market systems." Therefore, formal economics is not helpful in explaining or understanding aggregate behavior for most of history and for most societies. "The economist cannot be of help to the student of primitive economies; indeed, he may hinder him." The anthropologists who have sought to study primitive economies "within the framework of orthodox economic theory" have fallen into methodological traps.

What are the qualities which, it is said, are possessed by the economies for the study of which conventional analysis is not helpful? They are: inflexible or sluggish prices or exchange ratios; inelastic (sometimes absolutely inelastic) supply; inelastic (sometimes absolutely inelastic) demand.

The specific instances enumerated by the authors—e.g., set rates, customary or statutory equivalencies, gift trade, administered trade, status-trading, trading partnerships, the influence of kinship, magic and etiquette on economic behavior, noncompeting groups—seem to fall into one or more of these boxes.

It can be seen, for example, that the supply of imported goods at retail in Dahomey is less elastic than it would be if foreigners were not excluded from the trade; that the supply of watchman services would be more elastic in the Indian village if it were not necessary to be of the watchman caste to qualify for producing the service; or that the demand for the goods of a Tobriand Islander is less elastic than it would be if he were not bound to transact with specified "partners" and were free to exchange with all comers.

Now the conventional doctrine and techniques of formal economics have much to say about economies or markets in which inflexibilities and inelasticities occur. It is not true that economic analysis cannot perform useful predictive tasks in such economies. Even a quick glance at a text on economic theory (say, Kenneth Boulding's *Economic Analysis*) can show the attention which has been given to rigid prices and to the meaning, for a large number of analytical questions, of different degrees of elasticity of supply and demand schedules. That is to say, economics, in its "language" sense, can explain phenomena in economies in which prices are not free to move or in which demand and resources are not responsive to price changes. It can explain phenomena even in economies in which people do not maximize economic quantities.

But is it true, in fact, as the contributors to this volume profess, that people in the economies they have examined are not maximizers of economic quantities? People may seek to maximize in two distinct frameworks, one of which is free of constraints and the other subject to constraints. The first can be illustrated by the case of a hypothetical primitive who has pigs which he may exchange for yams at any pig-yam ratio and who may trade with anyone. The second is the case of the primitive who may trade at any pig-yam ratio but for whom a single trading-partner is specified. In both cases, the pig-owning primitive may maximize in deciding whether to trade at all, and, if so, how much pig he is willing to forego. The position taken in this book is that maximizing behavior or the achievement of optimal solutions requires the prior existence of a "System of Self-Regulating Markets" free of rules which

constrain choice and (implicitly) in which supply and demand schedules are price-elastic. This is surely not true.

It would have been interesting to examine whether, with given constraints, primitives do in fact maximize. If the traditional share of the rice heap "paid" to the barber in the Indian village is much below the value of his services to the community, is there no way in which he can escape to some other trade or reduce the quantity or quality of the services he renders? The door to this area of inquiry was foreclosed by prejudgment.

It would also be interesting to see whether, in primitive societies, the constraints themselves do not change when they interfere with the achievement of optima. If the technology of fishing progresses more rapidly than that of yam culture, does the fish-yam exchange ratio change, however slowly, in favor of yams? Here and there, hints appear that at least some constraining rules do so change. For example, in Assyrian trade, "the necessities of life were supposed to be subject to permanent equivalencies ('prices'); actually they were subject to long-range changes." This question, however, was also not really subjected to close examination.

The meaning given by the authors to the distinction between formal and substantive economics may be the source of the whole difficulty. Formal economics derives from logic and refers to the rules for choosing among alternatives. Substantive economics derives from fact and is the "process of interaction between man and his environment, which results in [want satisfaction]." The two, they say, have nothing in common; they "could not be further apart." And they propose that only the substantive meaning of economics can yield the "concepts that are required by the social sciences for an investigation of all the empirical economies of the past and present."

In neither respect are they correct. First, formal economics and the empirical economy have everything in common. Theory is not an isolated exercise in pure logic; it is an instrument for making predictive statements about experience and these predictions are tested by reference to the real world. Secondly, while economies can be described empirically by exclusive reference to them, fruitful predictive statements cannot be made by this procedure and it is precisely the task of the social sciences to make predictions about social phenomena. John Neville Keynes once said: "The prevalence of a low type of inductive reasoning in the treatment of economic questions is one of the most fertile sources of economic fallacy."

The only way to know whether the usual economic theory will give good predictive results for primitive economies is to test the predictions derived from the theory by observing whether empirical observation is consistent with the predictions. This the authors did not do. What they did instead was to examine the conventional assumptions of the theory and seek to determine whether these found empirical counterparts in the primitive economies. This is a fruitless search. The conventions of economic theory (as of any manipulable theory in any scientific discipline) are so ideal and abstract that they are found in no real world. The significant question is not whether real-world duplicates can be found for the assumptions, but whether real-world observed experience duplicates theoretically derived predictions.

The book does not quite carry the day and claims ("first breakthrough," "fundamentally different starting point," "a significant widening of our outlook," "the threshold of much more comprehensive research in the social sciences may well have been reached") are more impressive than achievement.

SIMON ROTTENBERG

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*Rich Lands and Poor: The Road to World Prosperity.* By GUNNAR MYRDAL. New York: Harper & Brothers, 1957. Pp. xx, 168. \$3.00; text ed. \$2.25. (Published in England as *Economic Theory and Under-developed Regions.*)

The very large and steadily increasing income differences between developed and underdeveloped countries constitute the focus of Gunnar Myrdal's new book, a revised version of the Anniversary Commemoration Lectures of the National Bank of Egypt, delivered in Cairo in 1955 (published by the bank under the title *Development and Underdevelopment: A Note on the Mechanism of National and International Economic Inequality*, Cairo 1956). As the eminent Swedish scholar points out, "though these inequalities and their tendency to grow are flagrant realities, and though they form a basic cause of the international tension in our present world, they are usually not treated as a central problem in the literature on underdevelopment and development" (p. xviii). Part I of the book attempts to explain why and how these inequalities came to exist, why they persist, and why they tend to increase, and touches briefly on the question: How could these trends be reversed? Part II inquires into the reasons for the relative neglect of these questions in orthodox economic theory.

An examination of the sources of income inequality between regions within a country provides the model for interpretation of the international differences. While some attention is devoted to political factors (and there is much of interest in this discussion) the center of the analysis—and the part most challenging to standard economic theory—concerns the role played by free market forces. Economic growth is conceived as a cumulative process—in part because of a circular interaction of rising investment, incomes, demand, and investment; in part, and more importantly, because of "ever-increasing internal and external economies—interpreted in the widest sense of the word to include, for instance, a working population trained in various crafts, easy communications, the feeling of growth and elbow room, and the spirit of new enterprise . . ." (p. 27). Thus, an initial change for the better is conceived to produce a cumulative movement upward; conversely an initial change for the worse sets in motion a cumulative process downward. If a cumulative upward movement is initiated in one region, it is argued, this gives rise via movements of goods and resources to certain adverse changes ("backwash effects") in other regions, which initiate a downward movement. For example, an influx of products from the growing region tends to destroy handicrafts in the poorer region, or out-migration from the poorer region has adverse effects on the age composition of the population and thus on the productivity of that region. The resulting downward movement tends to cumulate because the provision of such

things as public utilities, medical services and education in the poorer region shows a relative deterioration. To be sure, there are certain positive repercussions or "spread effects" on the poorer region, such as the new market for raw materials for the developing industries in the growing region. And there are factors which may slow down the cumulative process in the growing region and have favorable repercussions on the poorer—"external dis-economies" arising from excessive concentration of industry and population, rising wage costs which may drive industry away, a growing stock of outmoded equipment, and so on. But such factors are considered to be "complications and qualifications" (p. 35), and it is held that in the normal case the backwash effects will outweigh the spread effects, and that typically "the play of the market forces works toward inequality" (p. 26). The possibility of an exception is recognized in the case of rich countries, where the spread effects exert greater influence because economic growth is accompanied by "improved transportation and communications, higher levels of education, and a more dynamic communion of ideas and values" (p. 34). But when the analysis shifts to the all important problem of international as opposed to regional income differences, it is asserted that "the spread effects are much weaker and the cumulative process will more easily go in the direction of inequality if the forces in the market are given their free play" (p. 56). So far as policy is concerned, the general conclusion is that "economic development has to be brought about by policy interferences by the world community or by the individual underdeveloped country . . ." (p. 53).

Needless to say, this brief sketch is an inadequate outline of the author's analysis—in particular, the stimulating and provocative consideration of the role of noneconomic factors in the cumulative process has not been treated. Moreover, one cannot be sure that a fair representation has been given even with regard to the portion relating directly to economic theory, since the analysis in the original is loosely formulated. But the presentation does perhaps serve to highlight the principal challenge which Myrdal directs to the usual conclusions of economic theory, namely that the income-equalizing processes ordinarily emphasized—trade, migration, and capital flows—in fact tend to have just the opposite effect. And on this point he is quite explicit: ". . . The movements of labor, capital, goods and services do not by themselves counteract the natural tendency to regional inequality. By themselves, migration, capital movements and trade are rather the media through which the cumulative process evolves—upward in the lucky regions and downward in the unlucky ones" (p. 27). To be sure, this assertion is moderately qualified later on, when allowance is made for the "spread effect" of trade (though not, it should be noted, for that of migration or capital flows), but as the foregoing sketch suggests, it is maintained that typically the net effect of these flows of goods and resources is to widen income differences.

It must be added, however, that Myrdal's position on this point seems somewhat equivocal. For, as noted, he does recognize the equalizing or "spread" effects of certain of these flows, and even goes so far as to say that "it would be possible to conceive a situation where in a very rich country the spread effects would on the average be stronger than the backwash effects, with the

result that inequalities would actually be diminishing *as an effect of the play of the market forces*" (p. 39, italics added). Now in view of what has gone before, this is a rather puzzling statement. For if sustained growth is initiated in one area in a low-income country, and then, following Myrdal, flows of goods, labor, and capital, set in motion a process of ever-widening income differences among regions, one wonders how this process is ever to be reversed, especially when one also takes into account Myrdal's emphasis on certain cumulative processes which reinforce the initial tendency towards divergence of income levels.

But, it might be argued, this is mere theoretical quibbling. Does not the overwhelming evidence of the growth of international income differences in the past itself testify to the validity of Myrdal's model and the erroneousness of the conclusions of standard economic theory—specifically international trade theory? The answer to this would seem to be that the conclusions of standard theory have very little relevance to the problem at hand. For these conclusions are drawn from a static model which bears little resemblance to the international scene of the past 150 years. The outstanding economic fact of this century and a half is the unparalleled cumulative development in the body of technological knowledge applicable to economic processes. And it seems self-evident that the pattern of ever-widening international income differences is to a very great extent a reflection of the marked differences among nations in the rate at which this new and ever-expanding technology has been absorbed. One might maintain, of course, that in theory the diffusion of new techniques, under competitive pressures, should proceed rapidly. But such an argument fails to allow for the wide variations among nations in factors such as historical heritage, politico-social structure, natural endowment, and demographic pattern, and the fact, clearly established by the experience of presently developed nations, that absorption of this technology demands extensive internal adaptations not only in economic organization but in the whole structure of individual and social life.

Now when one takes account of these manifestly relevant circumstances, it is hardly surprising that international income differences have progressively widened despite the enormous expansion in international flows of goods and resources—itself without historical parallel. For it seems a plausible hypothesis that while these flows may have worked in the direction of equalizing income levels—as static theory would suggest—that their quantitative effect was far outweighed by the unprecedented pace of technological advance and differential absorption of this technology by the nations of the world. Moreover, the hypothesis would be consistent with resort to these flows for explanation of the observed tendency towards convergence of regional income levels *within* some developed nations, for in this case the relative magnitude of these flows would quite clearly be larger and the differential geographic impact of technological change much less.

To be sure, the foregoing is no explanation of the widening of international income differences—one might almost say it is a truism. Nor is it necessarily to disagree with Myrdal's conclusion that the economic development of under-developed countries can not be left to the free play of market forces. But it

does suggest a shift in analytical focus—from the international economic flows emphasized in static analysis and emphasized also by Myrdal, though with “inverted” effects—to the basic internal processes which encourage or inhibit exploitation of the new opportunities made possible by modern economic technology. This is not to deny the possible importance of international factors—whether economic or noneconomic—in the process of national economic growth, but one wonders if these forces are not sometimes made to bear undue weight relative to internal processes.

It goes without saying that a work from the pen of Gunnar Myrdal is well worth reading. There is much that is stimulating and valuable—the emphasis on circular causation and the factors involved, both economic and noneconomic, in the process of economic growth; the discussion of the role of the state and the colonial system; the penetrating remarks on the current political relations between the developed and underdeveloped countries; and the criticism of the preconceptions of current economic theory. And above all there is the ever-present concern with the relevance of economic theory to the diffusion of material well-being and the growth of political democracy.

RICHARD A. EASTERLIN

*University of Pennsylvania*

*The Economics of Full Employment in Agricultural Countries with Special Reference to India and Ceylon.* By C. SURIYAKUMARAN. Kandy, Ceylon: K. V. G. DeSilva, 1957. Pp. 307. Rs 12/50.

The author of this book is 35 years old. He received his B. Econ. degree at the University of London in 1945 and subsequently spent two years in the United Kingdom and on the continent of Europe “in practical work and post-graduate study.” The publisher refers to the present book as that of “the first Ceylon economist to publish a full work.”

The outstanding characteristics of the book are the great breadth of treatment and the reading upon which it is based. This reviewer would have liked to have found more of specificity as to the lines that economic development should take in such countries as India and Ceylon. The author deliberately rules this out, however, by distinguishing between policy and programs and saying that his book considers only policy.

The main conclusions reached are that first emphasis should be placed on wage-goods industries producing goods that replace imports, and second emphasis on industries like housebuilding and the like and then on export industries “wherever feasible under world competitive conditions.” Industrialization is the remedy for unemployment and underemployment, both of which are endemic in underdeveloped agricultural countries. But he defines industrialization broadly enough to include “large-scale programmes for agriculture, raw materials, and certain processed ‘consumption’ goods” (p. 290).

The next link in the chain of reasoning is that such industrialization can be achieved only by investments and that investment savings are in scant supply in such countries. Ways must be found, therefore, for channeling more of what savings there are into industrialization investment, and in this the state has a large role to play. Suriyakumaran does not go so far as to advocate the extreme

enforced savings measures employed by the Russians, but in general takes the position that countries like India and Ceylon need to carry planning and state direction and conduct of economic activities to a degree maybe half way between that of the Russians and that of the extreme Western world. (He very carefully discriminates between Russian and Communist.)

The other source of investment funds must be the United States and other countries with large supplies of these. The author builds up a strong case for the gains that will come to these countries from trade with India and Ceylon and their like when these countries become balanced economies. He pictures a world of the future in which even the rich countries will live more abundantly as a result of obtaining from other countries the goods which the latter are best qualified to produce. In the period while the agricultural countries are getting their wage-goods industries developed, however, their use of import quotas and even of protective tariffs, preferably the former, is not only warranted, says Suriyakumaran, but highly to be recommended.

Considerable attention is given to the question of large-scale and heavy industries versus small-scale and cottage industries. The conclusion is that both are needed, the latter because of the need for employment close to the homes of families with surplus workers all or much of the year, also close to sources of raw materials. Lack of coal and iron in Ceylon limits heavy industry.

The author takes a strong position against using public funds in leaf-raking and other make-work employments. Instead, they should be employed along with capital investment in developing new industry. Full employment is carefully defined as something more than a job for everyone. Merely putting a person to work at a task that yields little product is not enough. The level of living attained is also an essential part of full employment. But very little is said to indicate what this level is to be (Suriyakumaran actually uses the term standard of living, but what he means is level of living.)

One of the longest chapters outlines the national planning needed before any undertaking in industrialization is begun, its *modus operandi*, and all the factors that must be taken into account, such as consumer's choice, wages, prices, costs, and international exchange balance.

Really only one chapter (Ch. 9 in the center of the book) is devoted to describing the economic organization of the two countries chosen as cases. The two countries differ greatly in one important respect. Half of the income of Ceylon is from exports of tea, rubber and coconut, largely grown on plantations. But still three-fourths of the rural dwellings in Ceylon and two-thirds of the urban ones have only one or two rooms. Most of the rural houses in both countries are mud huts with thatched roofs.

The author in conclusion says that the theory he employs in his analysis is after all only the general theory of employment and unemployment, and that there will be residual unemployment in agricultural countries as long as there is any capital starvation; and after this has been cured there will be frictional unemployment and the traditional unemployment that comes with depressions.

JOHN D. BLACK

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*Indonesia's Economic Stabilization and Development.* By BENJAMIN HIGGINS.  
New York: Institute of Pacific Relations, 1957. Pp. xxii, 179. \$4.00.

In this interim report by the Massachusetts Institute of Technology Center for International Studies on its ambitious survey of Indonesia, Professor Higgins briefly describes and appraises both the short-run stabilization measures and the long-run development policies adopted by the young republic.

With an 83 million population that is growing at a 1.7 per cent annual rate and is plagued by disguised unemployment, Indonesia faces an urgent yet difficult development problem. Fortunately, however, a lack of natural resources does not constitute a serious development obstacle. The main requirement centers around the complex problem of increasing the rate of capital accumulation. Higgins estimates that an annual net investment rate of about Rp. 12 billion is necessary to initiate and sustain a 2 per cent annual rise in per capita income. Consequently, as one who stresses the importance of a "big" push to break out of the vicious circle, he contends that the approximately Rp. 6 billion of annual public and private net investment outlined in the first phase of Indonesia's five-year plan is inadequate. He also argues that insufficient attention is directed towards the fostering of entrepreneurship and towards the development of large-scale industrialization projects.

According to Higgins, the present modest plans for capital formation are not limited so much by an inability to secure domestic and foreign investment funds but rather by a political environment that prevents any government from making clear-cut decisions concerning the format of the Indonesian economy. Before significant development efforts can be undertaken, the Indonesians must decide such issues as the future importance of the traditional "family-like" society, of foreign businesses, and of public enterprise.

Higgins not only fills an important gap in our knowledge of Indonesia, but for those interested in general development issues he provides an excellent, concise case-study of the type of problem faced by the poor nations. Perhaps he overemphasizes the need for a substantially greater initial effort to start a cumulative development process, but, utilizing the growing body of economic, political, and sociological knowledge collected by his group, he does present convincing reasons for his conclusions. Certainly, to judge by this short report, the final study of the Indonesia Project which will integrate the results of all its economic and sociological surveys promises to be an outstanding contribution to development literature.

ROBERT E. BALDWIN

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*Land Reform and Development in the Middle East.* By DOREEN WARRINER.  
New York and London: Royal Institute of International Affairs and Oxford University Press, 1957. Pp. vii, 197. \$2.90.

The Middle East is a land of dilemmas, paradoxes, and enigmas. It is also an area in the process of rapid and sometimes bewildering change. Into this tangled situation of problem within problem Miss Warriner casts a bright light from the perspective of years of study of the conditions of agricultural progress. This book, a sequel to her modern classic, *Land and Poverty in the*

*Middle East*, published in 1948, is not a general essay on land reform and economic development. Rather, it is a surefooted selection of critical variables in change with reference to unique situations.

The author's thesis is that the picture of the Arab world as static and medieval is no longer true. Three new dynamic forces are observed: (1) the money from oil in Iraq; (2) the private enterprise of "merchant-tractorists" (merchants who have financed the mechanization of extensive agriculture) in Syria; and (3) the revolutionary development of a national function for the professional middle class, and of a new status for the fellahin in Egypt. She sees hope for the struggle against poverty only in the confluence of the three forces. It is a measure of the irony of nature and of history that each country lacks what the other has.

The platform from which the author writes is that "The need for reform is two-fold, a social need for a higher income for the cultivators, and an economic need for better farming through more investment and better methods" (p. 7). The basic malady in the three Arab countries here considered is seen to be the prevalence of institutional monopoly in land-ownership, linked with a monopolistic supply of capital to agriculture (p. 6).

Since this is her outlook, it is to be expected that she should view with favor the 1952 land redistribution in Egypt and the advent of a new merchant-tractorist group in Syria, but should see little hope for an engineering of huge public works projects in Iraq unaccompanied by basic change in the social structure.

The author concludes that in the Egyptian land reform of 1952, "The Government has done as much as was practicable, and far more than might have been expected" (p. 48). She observes that it was carried through with no change in the type of farming or the scale of operation and with a high degree of administrative competence. According to the author, "There can be no doubt that the farmers have gained a considerable increase in income. It is true they have not become independent owners, and that the cooperatives are managed by state officials, in what is, in effect a system of collective farming" (p. 47). Again, "In practice, though not in theory, the redistribution of property means the land is nationalized" (p. 48).

But the situation in Egypt remains desperate, with mounting population pressure, which can be met only by massive capital outlays on irrigation and new industry. The author is not overly sanguine about the present (she points to the doubtful success of lowering rents and raising wages by decree) but she often makes apologies for the future. Thus: "Egypt . . . gets the men and women and land ready for the water, while raising funds and the whirlwind by playing Great Power politics. If the pitch seems rather too high, and the expenditure rather too lavish, that is probably the only way in which anything can be accomplished in this very old country" (p. 54).

In Iraq and Syria (in contrast to Egypt) the author points out that land areas are expanding, yields are low and variable, and agriculture is extensive. The social structure is looser and less stratified. She finds that few underdeveloped countries in the past ten years have made such rapid progress as Syria (p. 71). This is in spite of the fact that Syrian governments have done almost nothing to promote agricultural development, and is due to the fact that "The

merchant class of Syria, and chiefly of Aleppo, famous as traders in other countries, has turned its business acumen back into its own country and has used its capital to mechanize agriculture" (p. 75). This enterprise was quite unlooked-for by the author ten years earlier.

In this reviewer's opinion, the most interesting section of the book is on Iraq. The author finds that "Iraq's experience is fascinating, because it demonstrates what money can and cannot do" (p. 113). "What money apparently cannot do is increase production. . . . Nor can money bring about a rise in the standard of living" (p. 125). The fault is: ". . . the social structure of the country is not adapted to expansion" (p. 121); there is no new economic class to rival the power of the landowners (p. 172). Oil does not create a class of domestic enterprisers. "Iraqi planners have yet to learn to do little things. The result is that too much is invested in the big projects, and not enough in working capital, or in human resources. The country is an economist's cloud-cuckoo land, in a Hayekian gap without a crisis, and building Keynesian pyramids without inflations or multipliers" (p. 126).

The social vacuum in Iraq's tribal society, in its villages and its cities, and the gaps between new and old and young and aged are convincingly described. The author is frank to say that she cannot foresee how the vacuum in social relationships will be filled (p. 183).

The reader is cautioned against association of economic development and solution of political problems of the West. "Land reform is a way of raising the standard of life and of raising production, and rather a slow way. It is not likely to pluck irons out of the fire for the West, or to settle issues in the cold war" (p. 186).

The book is written in a mood of intense concentration on the main problems at hand. The mood is broken with a few rather academic catalogings of land-tenure practices which are not fully integrated with the rest of the book. The subdued fury with which the frustrations are described is lightened by a journalistic air with which the reader is introduced to a wide variety of persons and places. One leaves the book with the hope that Miss Warriner will not wait ten years for her next book on the Arab East.

ROBERT J. LAMPMAN

*University of Wisconsin*

*The Growth Rate of the Japanese Economy since 1878.* By KAZUSHI OHKAWA and ASSOCIATES. Tokyo: Kinokuniya Bookstore Co. Ltd., 1957. Pp. xvii, 250.

This book is the first of a projected series of English translations of studies conducted by the Hitotsubashi Institute of Economic Research during the past decade or so. The Institute, staffed by a very able group of economists formerly under the direction of Shigeto Tsuru and presently of Keiji Ohara, has been undertaking a comprehensive quantitative survey of the Japanese economy and much of the preliminary results has already appeared in Japanese. In this volume, the Institute's national income and capital studies are presented as an interim report.

The pioneer work on the long-term estimates of Japanese national income was carried out by Yuzo Yamada of Hitotsubashi in the study *Nihon Kokumin*

*Shotoku Suikei Shiryo* (Tokyo 1951). (The studies of S. Hijikata in the 1930's also deserve to be mentioned.) Ohkawa's work is an extensive reworking of Yamada's series.

The book contains estimates of national income by industrial origin from 1878 to the present and a detailed discussion of the methods, sources and reliability of the figures. Since income in current prices is deflated to a constant-price basis and reduced to per capita units, there are also chapters on price indices and population statistics. A third portion of the book (the work of Ito and Shinohara) is devoted to estimates of capital formation and capital coefficients. To Western students of Japan, the wealth of supplementary statistics—the best currently available—and the discussion of source materials from which the estimates were constructed may prove to be just as valuable as the income estimates themselves.

The authors are well aware of the difficulties and pitfalls in the measurement of the income, savings and capital of Japan going as far back as the beginnings of modern Japan. Their report is replete with caveats and candid references to the weak points of their work. The major finding is that national income in 1928-32 prices grew at an average (compounded) rate of about 4 per cent per year during 1878-1942; and with population growing at a rate of 1.2 per cent, the rate of increase of per capita income was about 3 per cent. On the basis of my own studies, and for a number of reasons too involved to be stated here, my guess is that 4 per cent overstates the increase and the true rate may be closer to 3 per cent. The value of Ohkawa's study, despite a host of difficulties, is that it is possible to state with some degree of confidence that the national income of Japan grew at a rate ranging from 3 to 4 per cent. Another important finding is that the secondary sector (mainly manufacturing) grew about three times as fast as the primary sector (agriculture). (This compares with two times faster in the United States for a comparable period and suggests a number of interesting problems concerning Japanese growth.) The estimates are too crude, as the authors point out, for the changes in the rates of growth from decade to decade to be taken seriously. For example, the rates of growth shown for the early decades appear too high to me, particularly since industrialization did not make a significant start until the turn of the century.

The estimates of saving and total capital (even their levels let alone their changes) are also regarded by the authors as based on shaky grounds. But here again if Ito's estimates based on comprehensive wealth data are compared and checked with Shinohara's figures based on detailed but less comprehensive source data, it appears that the average capital-output ratio was somewhere around 3 to 4 and the average saving-income ratio was around 10 to 15 per cent. (In terms of the Harroddian formula, and assuming the equality of the average and marginal capital coefficient, if the growth rate is 3 to 4 per cent and the capital-output ratio is 3 to 4, then their product, the saving ratio, is from 9 to 16 per cent.)

The dollar estimates of the United Nations Statistical Office for 1952-1954 show Japan's per capita dollar income to be about one-tenth that of the United States, one-fifth New Zealand's and Sweden's, one-half of Argentina's and about the same as Mexico's. Even if we double Japan's per capita dollar

income to allow for understatement in the deflation procedures, Japan's per capita income is only one-fifth of the United States', less than one-half of New Zealand's, and about equal to Malaya's. A puzzling question is posed by this comparison: what happened to all the increases in national product and productivity represented by the rapid rate of growth over nearly a century? (Even if we allow for an upward bias and reduce the over-all rate from 4 to 3 per cent, Japan's per capita rate still represents an impressive achievement and compares favorably with those of the United States, Canada and Sweden, countries with the highest rate over a long span of time.) Part of the answer may be that Meiji Japan in the 1870's started with a level of per capita income considerably below that of the United States in the 1870's, and another element may have been the unusually rapid structural shift from agriculture (low-income sector) to nonagriculture (high-income sector). Or it may be that per capita dollar comparisons for civilizations as far apart as Asian and Western civilizations are statistically meaningless over a wide range of income. Granting all this, the fact remains that levels of living (meaning more than incomes and including length and intensity of work) in Japan today are far below those of Western countries. A significant part of the increases in Japanese national product and productive capacity must have been dissipated in wars and preparations for wars. If this is so, is such a high rate of growth desirable, especially since it entails almost inevitably an authoritarian political structure? Because the development of Japan is so relevant to the economics of growth of other Asian countries, one hopes that in their analytical studies which are now under way, the Hitotsubashi economists will be able to throw some light on this question.

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### **Statistical Methods; Econometrics; Social Accounting**

*The National Economic Accounts of the United States. Hearings Before the Subcommittee on Economic Statistics of the Joint Economic Committee, 85th Cong., 1st sess., October 29 and 30, 1957. Washington: Supt. Docs., 1957. Pp. 302. 75c.*

One of the most important advances in economics in the last twenty-five years has been the development of the national economic accounts, which are now known and used in varying degree by almost everyone in the profession. The complexity of the accounts has made necessary an extension of the division of labor within the profession with the development of specialists in the national accounts. This division of labor creates a need for communication from the specialists to the profession at large concerning the nature and intelligent use of the accounts. It also creates a need for periodic appraisal of the accounts from the point of view of the economic analysts who use them.

With the latter objective in mind the Bureau of the Budget requested the National Bureau of Economic Research to set up a National Accounts Review Committee. A committee of nine members was appointed in November 1956 with Raymond W. Goldsmith as chairman. This committee completed its report in June 1957. On October 29 and 30, 1957, hearings on the report

were held by the Subcommittee on Economic Statistics of the Joint Economic Committee of the Congress. The volume under review contains the transcript of those hearings and, as an appendix, the report of the committee appointed by the National Bureau.

The objective of the committee was to provide in its report "a road map for national accounting during the next 5 to 10 years." The main recommendation of the committee is for the development of an integrated body of national accounts. The committee distinguishes five segments of the national accounts, including, in addition to the national income and product accounts, the international balance of payments statement, the flow-of-funds statements, input-output tables, and the national balance sheet. The committee recommends that attention be given to the conceptual integration of these five systems of accounts, with eventual publication of a single combined set of accounts. Responsibility for this publication should be given to a single agency, the committee believes. The committee worked out and included in its report a set of accounts and tables illustrating how a unified set of accounts might be organized.<sup>1</sup>

The committee's case for integration is persuasive; but in view of the uneven development of the different sections of the accounts, an integration of the accounts of the type the committee proposes must be regarded as an ultimate goal rather than a practical possibility for the near future. Integration also raises questions in the minds of the officials of different agencies concerning their role in the integrated effort. Integration, nevertheless, should be the goal.

The report contains a discussion of the present status and objectives of each segment of the national accounts. Several chapters deal with various problems and proposals having to do primarily with the national income and product accounts. An interesting chapter appraises the statistical adequacy of these accounts. The other segments are treated more briefly.

The further recommendations of the committee are numerous and do not lend themselves easily to summary. As far as the national income and product accounts are concerned the committee took the position that the work of the National Income Division is of high quality and that little improvement can be expected without an expansion of the resources devoted to its work. The committee deplores the cut of about one-quarter in the staff of the National Income Division from 1951 to 1957, and urges that this trend be reversed. The committee also makes a variety of proposals for the improvement of the underlying statistical series on which the national accounts rest. It notes what its chairman refers to as our "scandalous ignorance" about unincorporated business, and the lack of information about capital expenditures. The committee also stresses the importance of a more complete set of constant-dollar estimates by the National Income Division, including quarterly data. Of a group of 61 users of the data polled by the committee, more mentioned need for quarterly data on GNP and its principal components in constant-dollars than any other extension of the national accounts. The committee recommends that quarterly data in constant prices should be published in the near future,

<sup>1</sup> This system, the committee notes, was strongly influenced by that set forth in *National Income Accounts and Income Analysis*, Richard and Nancy D. Ruggles, New York 1956.

with a more elaborate program of constant-dollar estimates in the longer run, including, for example, the development of additional price indexes appropriate for deriving constant-dollar estimates for such commodities as producers' and consumers' durables. It may serve to illustrate the range and diversity of the recommendations related to the income and product accounts to mention as examples the following: a proposal that the personal segment of the accounts be deconsolidated to show separate figures for households and institutions (such as nonprofit organizations); a proposal for an improved classification of expenditures which, among other things, would show separately gross outlays for the acquisition of assets; a proposal that further development of regional and local estimates of national accounts should be undertaken at the local level rather than by federal statistical agencies; and a series of proposals concerning estimates of size distributions of incomes. The committee also makes a series of recommendations concerning flow-of-funds statements as these are being developed by the Federal Reserve Board, particularly stressing the importance of the effort now being made to put these statements on a quarterly basis. It recommends that work on input-output tables by the government should be resumed and that a table should be constructed based on the 1958 economic censuses. It also proposes further work on estimates of the national balance sheet but feels that this work should take the form of a study by a private research institution in view of the roughness of the estimates and the unresolved conceptual problems in the field.

The list of recommendations, in the reviewer's opinion, mixes together proposals which are of vital importance and proposals whose importance is secondary. An alternative program for the committee would have been to focus attention on those areas in the national accounts where improvement is most urgently needed. The report pays little attention to the crucial practical question of priorities. In which areas would additional expenditures make the greatest contribution to knowledge of the economy? The proposal to obtain reliable data on saving separately for unincorporated businesses, households, and nonprofit organizations deserves a prominence which it did not receive in the report. The remark about our "scandalous ignorance" about unincorporated business is no exaggeration.

Even in a report which makes so many recommendations some topics are slighted. The reviewer, for example, is interested in the relation between micro-economic data and the national accounts and, in setting up a program for the next decade, would have placed more emphasis on the need for integration of cross-section and aggregate data. Direct insight often can be obtained into the forces creating movements observed in the aggregate statistics by identifying the relevant decision-makers and interviewing them. Information about who is performing a given type of economic activity is a step toward constructing a satisfactory explanation of why they are taking this action. Distributions of income consistent with the aggregate data are now being published, but for such items as assets, debts, saving, and investment, no such distributions are available.

But specific criticism should not distract attention from the merits of the report. The committee has laid out a broad program for the development of the national economic accounts. One cannot read the report without respect for

the technical competence of its authors and appreciation for the effort devoted to its preparation. If the proposals of the committee are carried out, the accounts will be greatly improved as tools of economic analysis and our knowledge of the working of the economy correspondingly extended.

JOHN B. LANSING

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*The Lognormal Distribution with Special Reference to Its Uses in Economics.*

By J. AITCHISON and J. A. C. BROWN, University of Cambridge, Department of Applied Economics, Monograph 5. Cambridge: Cambridge University Press, 1957. Pp. xviii, 176. \$6.50.

The central limit theorems of mathematical statistics are almost magical in the way that they bring order out of chaos, and statisticians have been quick to use them to rationalize basic harmonies observable in an apparently unruly world. By means of the theorems, it has been shown that almost regardless of what a population is like, for large samples withdrawn from it, nearly all of our common statistics are approximately normally distributed. In addition, they have been used to show that, if the right conditions hold, populations themselves will be normally distributed. But each of these propositions has a parallel. The theorems lead to the conclusion that populations determined by other conditions, often more plausible, will be distributed log-normally (i.e., the natural logarithms of the values of the populations will be distributed normally). And though most common statistics are asymptotically normally distributed (perhaps in part this is why they are common!), the theorems show that certain interesting statistics are asymptotically log-normal. Unfortunately, these latter propositions have received too little attention. The monograph under review, the fifth in an excellent series, will provide well-deserved publicity for a neglected distribution. A scholarly account is given of the research done on the log-normal distribution since it was originally espoused by Galton, McAlister, and Kapteyn, and its usefulness in present-day research is documented. More than that, the monograph makes independent contributions to our knowledge.

There is almost no estimating problem in connection with the log-normal distribution which is not explored in this book. The literature has been combed for methods of estimating parameters of almost any conceivable kind of log-normal distribution, and for almost any form of sample data. Consideration is given to the simple two-parameter and the more unusual three- and four-parameter distributions, and the probit analysis distribution; and the grouped-data, ungrouped-data, censored, and truncated cases. The standard estimating methods are appraised for each estimating problem in terms of the often conflicting goals of statistical efficiency and ease of computation. The large-sample properties of these standard methods are compared when possible.

The unusual feature of this part of the book is the attempt by means of Monte Carlo sampling to examine the small-sample properties of the different methods, and to compare the graphical method of estimation with the more conventional ones. In view of the extreme care the authors have displayed in the rest of their book, it is surprising that they were emboldened to commit

themselves here on the relative merits of the different methods for small samples. One would expect *a priori* that the method of maximum likelihood would be better than the other methods. The small number of Monte Carlo samples and their mixed character precluded the possibility of satisfactorily testing this hypothesis, however, and as a matter of fact, no tests were made of the significance of the observed differences. A few informal tests made by the reviewer showed that, in at least some cases, the differences were not at all significant. About the only important conclusion that can be substantiated from the Monte Carlo sampling data is that the graphical method, which is so easy to apply computationally, seems to compare favorably with the other methods.

As electronic computers become available more generally, economic models used in empirical investigations will be freed of the restrictions imposed by computing difficulties. Increasing the flexibility of our models to allow for nonlinearities and special stochastic properties is certain to make them more realistic. Such increased flexibility is needed for example to take account of threshold effects. The probit model, long standard in biometry, is designed for just this purpose. The various forms of the probit model are now being used only occasionally in econometric research, but they undoubtedly will be used much more frequently in the future. Though the log-normal distribution does not necessarily figure in probit analysis, it usually plays a prominent role, so probit analysis and applications are described in detail in this book. Researchers in this area will be particularly grateful to Aitchison and Brown for their work on the convergence problem. A difficulty arising in probit analysis is finding initial values in the iterative estimating procedure which will be certain to lead to convergence to maximum likelihood estimators. A happy result of the authors' look at this problem is the tentative conclusion that convergence can be expected even for initial values unreasonably far from the maximum likelihood estimators.

Examples are given of uses to which the log-normal distribution has been put in a number of different disciplines, but detailed attention to substantive applications is reserved for two areas of economics. The subtitle of the book is justified by the chapters on size distributions of income and on analysis of consumers' behavior:

The log-normal distribution meets fairly well the quite sensible criteria the authors suggest for a specific functional form for the income distribution. The empirical fits presented are reasonably representative of what one finds in working with survey data. The log-normal distribution seems adequate for most analytic purposes, but if a high level of precision is required (e.g., for estimating income tax revenues) it should be used with caution.

The relationship between household expenditures and income is discussed in terms of a multiple threshold model. It is assumed that a household facing given prices has a set of income thresholds for each good which determines how many units of the good it will buy. By aggregating the market behavior of groups of households, log-normal "pseudo-Engel curves" are derived which describe average consumption at various income levels. In this formulation there is no ambiguity about where the apostrophe should be placed in the

expression "consumers' behavior." While there is an underlying theory in the background to describe the behavior of individual households, the empirical results obtained by utilizing the model are to be interpreted strictly in terms of group behavior.

A question which the authors did not take up—but, after all, they had to draw the line somewhere—is: What are the consequences of applying to income distributions statistical inference procedures which require the assumption of normality? Skewness in a population makes such procedures statistically inefficient and leads to biases in the selection of critical values. Though it can be shown that for large enough samples these effects are unimportant, statistical theory provides no guidance as to just how large the samples must be. The question is of some interest because the saving in computation is substantial if normalizing the distribution by transforming to natural logarithms can be avoided. A few simple calculations based upon formulae given by the authors show that, for many income distributions with which one is likely to come into contact (where the coefficient of variation is less than, say, one-third), the loss in statistical efficiency is insignificant. A sampling experiment performed by the reviewer (300 samples for each of a number of sample sizes and for  $V$  equal to .3 and 1.3) shows that for samples larger than 40, the biases will be negligible. For more skewed income distributions, the sample size must be somewhat larger for this to be true.

The number of typographical errors in the book is surprisingly small, but attention should be called to one which could be costly to a person setting up an electronic computer program for probit analysis on the basis of the constants provided on page 71. The constant  $d$ , erroneously reported there, should be .2316419. A researcher at the Cowles Foundation discovered this mistake the hard way!

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### **Economic Systems; Planning and Reform; Cooperation**

*Mengenplanung und Preisplanung in der Sowjetunion.* By HANS HIRSCH. Veröffentlichungen der List Gesellschaft E. V., Series B: Studien zur Oekonomie der Gegenwart, Vol. V. Tübingen: J. C. B. Mohr, Paul Siebeck, 1957. Pp. xii, 195. DM 24, 50.

This study attempts to summarize the results of Russian and western studies of Soviet economic planning from a theoretical point of view. Hirsch first deals with planning of quantities, that is, allocation in physical units, and with "financial planning" or allocation in value units. He then discusses their interaction with particular reference to the delegation of authority to make allocation decisions, and finally presents certain principles of price planning in the USSR.

The planning of quantities is, according to Hirsch, a balancing out of "quantities" demanded by the "leading links" of Soviet industries as determined by "party directives," on the one hand, against the production capabilities (including stocks and foreign trade deliveries) determined by rates of

aggregate output, on the other hand. Thousands of incommensurable commodity balances could presumably be reduced to comparable units by the functioning of money as a standard of value (*Evidenzfunktion des Geldes* in Hirsch's terminology). Hirsch argues, however, that "the quantitative ranking order of ends and goods cannot as such be translated into a financial system of values," either by an individual consumer or by a central planner (p. 74). This thesis is supported by three propositions. In the first place, there are no "quantitatively fixed relations of magnitudes in the quantitative ranking order which the consumer sets up with respect to his ends and goods as indicated in the price system." In other words, while the consumer measures the "economic importance" of goods and services ordinally (indifference, more or less important), the price system measures the "economic importance" cardinally. Secondly, while "the prices reflect at best the importance of the marginal unit (the 'marginal utility') of a good," the consumer's "ranking order is essentially related to the intramarginal region" (p. 71). Thirdly, whenever the demands are inelastic, "the prices do not really indicate the order of ranking of goods even at the margin" (p. 72). The prices reflect then the variations in the marginal costs of production rather than in the marginal utilities of consumers.

Hirsch failed to emphasize that for most purposes it is sufficient if relative prices correspond to marginal rates of substitution. His analysis lacks discussion of consumer's and producer's rents which supposedly equate "the economic importance" of the marginal unit to all the other intramarginal units. On the other hand, the concept of consumers' surplus itself has been criticized, particularly with respect to interpersonal comparisons of marginal utility. This fundamental difficulty appears to have been recognized by Hirsch when he states that "a consistent coordination of all choices is only then possible when one head can still review the entire region of coordination, comparing its elements in the imagination" (p. 75), but that "the determination of ends by the state presents a coordination problem of such magnitude that it infinitely exceeds the imaginative and coordinative power of any one head" (p. 76). Hirsch cuts the Gordian knot by a practical proposition, namely that the various ends (and presumably also the means) should be aggregated by the elimination of refinements until "the remaining assortment of ends can be reviewed by one head carrying out the highest coordination" (p. 76). The decisions arrived at by this "one head" in charge of the state affairs should then be dictatorially imposed on subordinate agencies, which are in turn permitted only to introduce certain refinements within the respective capacities of their "heads."

This theorizing based on political and administrative experience fails in meeting the economic issues. Hirsch argues that "the financial magnitudes obviously arise as a result of decisions made with respect to quantities in the choice of ends" (p. 80) and, therefore, the central authority is justified in disregarding prices as "regulators of quantities" (p. 81). A central planner allocates physical quantities very much in the same way as a private consumer or a business firm, that is, according to Hirsch, without reference to prices. Hirsch ignores the important role of prices used as weights in the balancing out of quantities by a consumer, a business firm, and a central planner. The

problem of mutual and simultaneous determination of prices and quantities is not explicitly discussed. Considerable doubt arises when Hirsch finally concludes that an allocation in physical units is theoretically consistent with a "financial system of values," but that such a mixed system has not been "consciously" realized in the USSR (p. 91).

All these and various other abstract discussions, whatever their theoretical importance, appear quite divorced from the "principles of price planning" presented in the last chapter, where the relevant writings of Baykov, Dobb, Jasny, Schwartz, and a few other authorities are haphazardly summarized. On the basis of these summaries, Hirsch purports to explain the alleged "irrationality" of Soviet prices by reference to the dynamic nature of the Soviet economy in three respects: (1) the structure of costs and productivity relationships, (2) the structure of demand, and (3) "the independent dynamics of the financial system" (inflation). But even within the static framework of economic theory, the Soviet price system contains, according to Hirsch, certain rational features such as "a direct regulation of prices in accordance with scarcity relationships" (p. 185). Prices are increased in order to encourage production and to discourage consumption, and vice versa with price decreases. Hirsch also argues that there are "considerable tendencies" towards a "rational price system," at least in the pricing of producers' goods, though Hirsch carefully modifies his findings by numerous qualifications.

This study deals with many important questions. Undoubtedly, it will be welcomed by specialists in the field of Soviet economics as a useful summary of research materials, despite its cumbersome style and many vague statements. The reader will have considerable difficulty in finding an answer to the crucial question which Hirsch considered the core of his study, namely the "why" (rather than the "how") of planning. Hirsch has failed to define the term "planning" as well as many other important concepts used throughout his study, leaving it up to the reader to infer various meanings from his terminology. This omission naturally detracts from the value of his contribution to our understanding of Soviet economic planning.

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*Ekonomika promyshlennosti SSSR.* (Economics of industry of the USSR.)

Academy of Sciences of the USSR, Institute of Economics. Moscow: Gosudarstvennoye Izdatel'stvo Politicheskoy Literatury, 1956. Pp. 463. Rbl. 10.20. [Referred to below as Book I.]

*Ekonomika sotsialisticheskikh promyshlennykh predpriyatiy.* (Economics of socialist industrial enterprises.) Moscow: Gosudarstvennoye Izdatel'stvo Politicheskoy Literatury, 1956. Pp. 471. Rbl. 10.50. [Referred to below as Book II.]

The two books under review mark the most recent progress attained by Soviet economists in the explanation of the economics of the industry as a whole and of the individual firm in particular in their economic system.

Book I, however, is more descriptive than analytical. It describes the planning of Soviet industry in great detail, it lists a great many of the interesting economic ratios and balances which comprise the plan; and yet at

the end it only comes to the general conclusion that they are important, leaving the reader without knowledge as to why or in what way they are important. It states that before new plans are elaborated the fulfillment of old plans is analyzed (p. 83); but it says nothing as to how this is done. It speaks convincingly about the necessity for a "rational location of industries" (p. 165), but it does not explain how it is achieved in practice. No doubt Soviet decision-makers on the industry level do use some methods of economic analysis in practice. Numerous quite elaborate articles in technical and engineering journals bear witness to this. Yet it seems that academic economists have not succeeded in translating this experience into a meaningful economic theory that could serve as a guide to action and to explanation.

There are some exceptions in Book I, however. The book goes, though to a limited extent, into an analysis of capital depreciation (p. 233) and the acceleration of the turnover of variable capital (p. 266); it provides interesting analytical indices of the comparative costs of different fuels (p. 306), etc. It also provides for the first time some revealing data on such things as, e.g., the number of labor shifts in various industries, on the computation of the piece-rate wages, and the structure of some prime costs.

Book II is much better. In the preface to this book it is stated that it was written by the Faculty of Soviet Economics at the Supreme Party School of the Central Committee of the C.P.S.U. It is slightly surprising that, unlike the above text of the Institute of Economics of the Academy of Sciences, this text prepared by a purely political school shows a remarkable awareness of genuine economics.

Book II consists of 13 chapters, partially overlapping those of Book I. They embrace the following topics: the development of Soviet industry; the management of individual enterprises; planning on the enterprise level; fixed capital and its productive capacity; variable capital and supplies; the organization of input of labor; labor productivity; wages; costs, prices, and profitability; economic calculations; enterprise finance; bookkeeping and accounting; the analysis of economic activities of the firm.

The microeconomics of the Soviet industrial firm has never before been described in such clear and precise terms as in Book II. Written probably for the instruction of party laymen, the book provides many practical suggestions and explanations of how and why the firm has to economize. Because of its simplicity and clarity the book may be accessible to interested Western students with but a limited knowledge of Russian.

Certainly this book does not explain everything, but it does convey the impression that the microeconomics of a firm under the Soviet system of total state monopoly is perhaps somewhat less complex than that of its counterpart under competitive capitalism. Soviet microeconomics is limited by a given plan: output quotas, prices, and costs are usually fixed from above. The firm can economize only by reduction of inputs and/or an increase in productivity. Book II describes a series of analyses of surpluses and economies resulting from different opportunities for manipulation of inputs and outputs. Of particular interest is, for example, the analysis of the situation in which the government permits an increase of prime costs in the producing firm, if, as a result of the improvement in its product, the consuming firm would

realize an economic surplus larger than the accretion of costs to the producer (p. 107). Of similar interest is the thesis that the projected capacity of an enterprise under construction should not be limited by the consideration of the presently existing bottlenecks, but instead should aim at the maximum feasible under the terms of long-run costs (p. 126). The reader of Book II will find many thought-provoking ideas, naturally sometimes contradicting established principles of economic analysis in the West, but nonetheless worth pondering and wondering about.

VSEVOLOD HOLUBNYCHY

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*Economic Planning by Programme and Control in Great Britain.* By GILBERT WALKER. New York: Macmillan Co., 1957. Pp. v, 175. \$3.75.

The stimulus for this book was an invitation from the Harvard Summer School to offer a series of lectures on economic planning in Great Britain. Gilbert Walker, professor of commerce in the University of Birmingham, set himself to enquire what the plan was and how it was operated until the change of government in 1951. He succeeded.

Beginning in true British fashion, the author traces briefly the major events exciting a mounting desire for planning. These include economic development accompanied by periods of serious unemployment, the end of dominion by Say's Law, and ideas for "social improvement." With this background, the reader is carried into theoretical and statistical foundations for program and control through a study of income flows, quantification, and social accounting.

"The British plan," Walker believes, "grew out of a determination, widespread during the war, that the second peace should not be marked by the slump, depression, and unemployment which had so marred the first." Experience during the second world war is examined by describing conditions related to dollar scarcity, temporary relief through Lend-lease, insufficient labor supply, and endeavors to control menacing inflation. The manner in which the economic system operated during these and other wartime gyrations is described by reporting the activities of central agencies attempting to solve the many difficult problems.

Fear of a return to prewar stagnation was lively in Britain as victory appeared on the horizon. History did not repeat itself. Rising prices, shortages, and an apparently chronic deficit in the balance of payments—not unemployment—were the dragons faced in 1945. The British were ready with a plan; they adjusted the plan to meet unexpected situations. Walker describes these adjustments by presenting the British design for "a system of democratic economic planning."

A chapter sets forth the manner in which a "democratic" program, a manpower budget, and an investment program were drafted and arranged. The mechanism for controlling imports is examined in a chapter of its own. Throughout his text the author follows a pattern of stating in succession the character of a threatening problem, describing the operations of organizations for preventing disorder, and offering pertinent comments of his own.

Much was accomplished during the war because, Walker believes, military purposes were paramount and recognized as such. The postwar system was soon in trouble because it had no engine to move the people toward a chosen objective. The elaborate postwar machinery for program and control has gone. Only "the most important controls" remain, a visible and constant reminder of Britain's orientation toward overseas trade.

One interesting and engaging note closes the book: "Planning for stability of income and continuity of employment in peace has perhaps this, and this only, in common with planning for a maximum of military output in war—that in each case the problem transcends national frontiers and combined policy undertaken by all the free nations is an essential requirement for success."

This short study is an excellent supplement to W. Arthur Lewis' *Principles* or J. E. Meade's *Planning*. The author has examined and summarized numerous white papers, surveys, and detailed studies of British wartime and postwar operations. A pictorial history of the emerging plan is a most attractive feature for readers with abiding sentiment. It begins with Lloyd George and Winston Churchill carrying the People's Budget in 1909; it portrays the hunger marchers in 1933; it presents Lord Keynes, Godfather of the Plan, as depicted by David Low; it shows Lord Beveridge, Father of the Plan, speaking at Caxton Hall in 1943. Needless to say the pictures delightfully outline some of the story that follows.

EDWARD G. NELSON

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### Business Fluctuations

*Inflation: A Study in Economics, Ethics, and Politics.* By G. L. BACH. Providence: Brown University Press, 1958. Pp. vi, 103. \$2.50.

*Prosperity Without Inflation.* By ARTHUR F. BURNS. New York: Fordham University Press, 1957. Pp. ix, 88. \$2.00.

*The Control of Inflation: An Inaugural Lecture.* By J. E. MEADE. Cambridge: Cambridge University Press, 1958. Pp. 52. \$1.00.

The formulation of a policy to maintain prosperity would seem, at first glance, to be a relatively simple matter since it appears to be to almost everyone's advantage that depression be avoided. In principle, there are very few toes to be stepped on by antidepression measures, and since there are no obvious conflicts of interest involved, the problems to be handled would appear to be simply technical ones; at least this was the common impression until a few months ago.

The control of inflation has, however, been generally regarded as far more difficult. Not only is the objective itself open to some question—for it is generally agreed that mild inflation does at least some good—but there is the additional problem that measures to check inflation are likely to run counter to at least the short-run interests of some of the most powerful sectors of the economy, and hence are likely to be strongly resisted. Most economists in

consequence seem to feel that prices are very likely to increase, assuming we can avoid prolonged depression.

Reading these volumes—which record lectures delivered between February 1957 and March 1958—certainly does not dispel the doubts that economists have entertained about the prospects of containing inflation. While the three writers, or speakers, urge a policy of price stabilization, and set out at least the broad lines of policy to assure it, they are very cautious about promising success. In my judgment, they make a convincing case for the view that we are faced with secular inflation, and we should be well-advised to consider means for rendering the experience tolerable.

They are united in their opposition to inflation—even to a gradual increase in the price level. Their strongest objection is to the inequities that inflation creates, especially for the aged, but also for other creditors and those whose incomes are relatively fixed by long-term contracts or other institutional arrangements. Burns and Meade are also concerned about the likelihood of difficulties in the inflation-ridden country's balance of international payments—a concern which clearly is unnecessary if inflation is widespread instead of being confined to a single country. Bach stresses the degree to which inflation distorts measures of profit, and so stands in the way of proper management decisions. His analysis of the consequences of a gradual inflation is the most detailed, but he too in the end concludes that the greatest objection to inflation is that it makes for inequities.

Their analyses of the causes of inflation are also essentially similar. Excessive demand and rising costs (or "sellers' push") are the main causal factors. The former can be avoided by a suitable combination of monetary and fiscal policies: Meade in this connection urges that attention be paid to the possibility of using some kind of levy upon personal incomes which can be promptly and frequently altered as demand becomes excessive or deficient. The pressures of rising costs can be at least minimized by keeping demand from becoming too high; by encouraging advances in productivity; by promoting restraint in profit mark-ups and in wage negotiations: Meade is hopeful that the publication at intervals of an official estimate of the average wage increase that would be compatible with price stability and full employment would prove helpful. Meade also suggests the desirability of increasing factor mobility in order to raise the employment level that is consistent with price stability; while Burns urges that the Employment Act be amended to include "reasonable stability of the consumer price level" amongst its objectives, not so much in order to remind public officials of their obvious duty, but rather to check the public's expectations that prices will continue to rise.

These numerous prescriptions are not put forward in a doctrinaire spirit or indeed with unduly optimistic statements of confidence about their efficacy. Their sponsors are too keenly aware of the difficulties of timing, of recent institutional developments that may minimize their effects (see especially Burns on monetary controls in this connection), and of the problems of securing assent. But it is difficult to imagine a new wonder-drug that could promise more.

But, do they promise enough? I think not: certainly not, if we are going

to avoid depression. It is hard to see why wages and profit margins should not be pushed up faster than productivity if times are good. It is no answer to threaten unemployment if prices rise. The profit margins that go up too fast, or the out-of-line wage increases that are secured, are not necessarily going to bring a cut in sales or unemployment to the businessmen or wage earners who enjoy them. The penalties may be levied elsewhere. In short, the price of price stability may turn out to be a level of activity much lower than society will or should tolerate. At least, none of the authors dispel this fear. Perhaps we will have to learn to live with inflation after all.

One final word: Burns discusses not only policy for inflation but also measures to prevent recession. In a way his words, which are eloquent and authoritative, make melancholy reading, for we have clearly learned so much and, at least recently, been willing to apply so little. He stresses the point that if we hope for success in controlling inflation in the future, we must take prompt and vigorous steps to deal with recession whenever it appears. Failing this, we are scarcely likely to secure the support of labor or business for the austere anti-inflation policies that will be needed.

These little books can be strongly recommended. They are persuasive and clear; and certainly no economists can speak with greater authority than their authors.

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### **Money, Credit and Banking; Monetary Policy; Consumer Finance; Mortgage Credit**

*Financial Intermediaries in the American Economy since 1900.* By RAYMOND W. GOLDSMITH. National Bureau of Economic Research Study in Capital Formation and Financing, No. 3. Princeton: Princeton University Press, 1958. Pp. xxxv, 415. \$8.50.

This pioneering study of the changing role of financial intermediaries in our economy provides a wealth of data on the growth in total assets of these intermediaries by type of institution from 1900 to 1952 (with some information back to 1850); on changes in the structure of their assets and liabilities; and on their shares in the financing, and in the channelization of saving, of different economic groups. Much of the basic data for these purposes were obtained from Goldsmith's earlier work published in *A Study of Saving in the United States*. While assets and liabilities data for virtually all individual types of financial intermediaries were available previously, they had not been put together in a consistent set of accounts and systematically related to the saving and financing of the ultimate suppliers and users of funds in the economy. In addition to the provision of an articulated set of accounts focusing on the interrelationships of financial intermediaries and the rest of the economy, which is probably the major contribution of this study, Goldsmith attempts to contribute to "a much needed general theory of financial institutions." Finally, he presents a wide variety of specific data on the size and geographic distribution of such institutions.

To summarize briefly the major findings of this study, the relative importance of financial institutions as a group is shown to have increased greatly over the past century. Probably since 1850 and at least since 1900 their assets grew at a rate of 6.7 per cent annually, which is faster than other relevant economic magnitudes such as the national income, national assets, wealth or saving. There is some evidence that this rate of increase has been diminishing in recent years. Currently, or more accurately in 1952, the assets of financial intermediaries represented 20 per cent of the total of national assets, 40 per cent of intangible assets, and—though this is a comparison Goldsmith doesn't think highly of—45 per cent of national wealth. Over the period covered by the study, the share of the banking system in the assets of all financial intermediaries has fallen, that of insurance organizations has risen—in recent years almost entirely due to the rise of government and private pension funds. Most of the funds raised by financial intermediaries have at all times been furnished by nonfarm households; the funds supplied by financial intermediaries are more evenly distributed among the major economic groups—with little change in the proportion going to nonfarm households over the last 50 years, a substantial increase in the share going to the federal government, and pronounced declines in the shares of business and agriculture. During the first half of the century, financial intermediaries supplied slightly more than half of all external funds absorbed by other economic groups, with an even higher proportion in the last 20 years: they have supplied two-fifths of all external funds and one-fourth of total net financing of nonfinancial corporations.

The study also indicates that in most groups of financial intermediaries a small number of large institutions account for a substantial fraction of the aggregate assets of all institutions of the same type and that the degree of concentration has generally increased over the last 50 years. The geographical density of financial intermediaries (where density is defined in various ways) is highest in the Middle Atlantic states and lowest in the South, with little change in over-all density over the last 50 years but some lessening in regional differentials.

Though Goldsmith's attempt to set up the general outlines of a theory of financial institutions is full of interesting observations on trends in various "immediate" and "ultimate" determinants of the role of financial intermediaries in the national balance sheet, the theoretical structure seems to me on the whole to be inadequate. The analytical apparatus used, which is handled with consummate skill, is primarily an attempt to describe how financial intermediary magnitudes have varied in relation to other national magnitudes rather than to analyze the basic supply and demand equations involved (relating to the asset and liability preferences of the various sectors). Goldsmith starts by breaking down the ratio of financial intermediary assets to total national assets—which of course is equal to the corresponding ratio for liabilities and equities—into the sum of four "basic" immediate determinants of the role of financial intermediaries: the ratios to total national assets of (1) non-metallic money, (2) insurance reserves, (3) other liabilities of financial intermediaries (excluding money and insurance reserves), and (4) financial intermediary equity (or net worth). The last two ratios he treats differently from the first two on the ground that there is "no competition for funds between financial

intermediaries and other debtors for these [first] two types of liabilities. . . . In the case of . . . other liabilities and equity, financial intermediaries . . . have to compete directly for them with other debtors and issuers" (p. 19). As a result, the ratios of other liabilities and equity of intermediaries to national assets, (3) and (4), are each expressed as the product of the share of financial intermediaries in such liabilities or equity and the ratio of the total of such liabilities or equity to total national assets. It is not clear why it is assumed that other liabilities of financial intermediaries, largely time deposits, can be considered competitive with other liabilities of nonfinancial groups, largely bonds and accounts payable. It may be, as Goldsmith seems to implicitly assume, that demand deposits (or insurance contracts) are less competitive with time deposits than the latter are with bonds, though this might be argued. However, it is difficult to understand how demand deposits can be considered less competitive with time deposits than the latter are with accounts payable.

After breaking down the ratio of financial intermediary assets to total national assets into the four main components indicated above, Goldsmith discusses the immediate determinants of each component ratio. For this purpose, he factors (i.e., expresses as a product) the ratios of each of the four major types of financial intermediary liabilities (and equity) to total national assets into a number of subsidiary ratios, resulting in a number of interesting findings but also raising a number of questions. In view of space considerations, I shall comment here briefly only on his treatment of the first ratio—the share of money in the national assets.

In introducing the analysis of the money-national assets ratio, Goldsmith states that "the volume of check (demand) deposits of commercial bankers . . . is determined primarily by the public's demand for cash" (p. 21). It is not clear why he seems to assume that changes on the supply side are largely irrelevant to an explanation of historical fluctuations either in the volume of money or in its relation to national assets. Monetary authorities can and do markedly influence the volume of money and, while it is true, as Goldsmith points out, that prices, interest rates and the national income may change in the re-establishment of equilibrium between the supply of and demand for cash, there does not seem to be any good reason for assuming that at the new equilibrium position the ratio of money to national assets remains the same as formerly.

Goldsmith factors the ratio of money to national assets into four subsidiary ratios: (1) money to national income; (2) national income to equity of ultimates (households and governments); (3) equity of ultimates to total equity of all units; and (4) total equity to total national assets. The first factor (Cambridge  $k$ ) has of course received most attention from monetary theorists and turns out to have the greatest influence in the observed rise in the ratio of money to national assets. It is not clear, however, why the other three factors should be expected to be particularly useful. The argument that the second ratio can be transformed into the "economically significant" capital-output ratio seems rather tenuous since the ratio involved is essentially not technological but rather a value ratio which depends among other things on the public's demand for assets of fluctuating value. For example, if income remains reasonably stable but corporate stocks go up markedly in price, as in

the late 1920's, the ratio of national income to equity of ultimates will go down even though the capital-output ratio may be unchanged in any economic sense.

Goldsmith notes that while the immediate determinants of the share of financial intermediaries in national assets can be (and have been) expressed "in a small number of fairly well defined and measurable relations" (p. 36), it is possible only to identify some of the ultimate economic determinants. These he designates as asset price movements and a set of national balance-sheet ratios—viz. the share of nonfinancial business in the national assets, the "financial interrelations" ratio of intangibles to tangibles, the capital-output ratio, the "deadweight" debt ratio (measured as the ratio of the balance sheet deficit of the federal government to total national assets), the short-long debt ratio, and "layering" ratios for financial intermediaries and for nonfinancial business. It might be questioned in what sense some of these determinants can usefully be regarded as "ultimate," totally apart from the point which Goldsmith makes that they are not necessarily independent. Thus the short-term debt ratio is simply a statistic which, depending on how short-term debt is defined, may be positively correlated with the share of financial intermediaries in national assets, but this ratio hardly seems to be a useful theoretical construct for the purpose used since it is not directly related to the behavior of any homogeneous set of transactions or transactors. Similarly, to explain the share of financial intermediaries in the national assets by the behavior of the financial interrelations ratio does not answer, or address itself to, the "ultimate" question of the determinants of the composition of assets and liabilities (which governs the position of financial intermediaries in the economy). Goldsmith finds that three of his ultimate variables—the financial interrelations ratio, the deadweight debt ratio and the movement of asset prices—are statistically most important in explaining past trends in the share of financial intermediaries in national assets.

The study presents an impressive array of other statistical data and analytical ratios relating to financial intermediaries which cannot be covered in this review. Some questionable conclusions drawn from the material presented, however, should be pointed out.

After noting that "The supply of funds . . . is an essential if not the primary economic function of financial intermediaries . . . [which] can be understood only through comparison to the volume of internal financing and of external financing from other sources" (p. 180), Goldsmith makes a number of references to the increased importance of internal financing in the structure of financing throughout the period. In discussing the financing of all nonfinancial corporations, he states "external financing has been somewhat less important since World War II in relation to internal financing than before 1929 if capital consumption allowances are regarded as part of internal financing. The decline is much more pronounced if internal financing is limited to retained earnings" (p. 221). Later, in his discussion of financing the American economy as a whole, he indicates that "The reason for the diverging trends in the share of financial intermediaries in total and in external financing is, of course, the increase in the proportion of internal financing, gross or net, in total financing.

This change in the relationship between internal and external financing is a basic development in the American economy . . ." (p. 302).

Goldsmith is, of course, repeating what many financial analysts believe to be true, but the figures he presents do not confirm these statements. The two sectors in the economy which normally utilize the great preponderance of internal and external sources of funds are nonfarm households and nonfinancial corporations. For the former there is no difference between 1946-49 (the latest period for which such data are shown) and the earlier 1900's in the ratio of (1) total internal sources (including capital-consumption allowances) to total sources of funds, and (2) net saving to total sources of funds. For nonfinancial corporations there is a rise in both ratios from the turn of the century to 1946-49, but for the later years 1950-52, which Goldsmith obtains from the Department of Commerce, there is no evidence of a secular increase in these ratios over the preceding half century. Moreover, subsequent Commerce data indicate that the first ratio has risen only slightly from 1950-52 to 1956-57 (and is apparently somewhat below its level at the turn of the century) while the second ratio has declined markedly (and is also below its level at the turn of the century).<sup>1</sup> The Goldsmith and Commerce data show about the same relation of internal to total corporate financing in the overlap years 1946-49.

It is possible that my interpretation of the aggregate data on corporate financing simply reflects the inadequacies of the estimates. There does not, however, appear to be much basis in these data for reference to structural changes or basic developments in the American economy in the proportion of internal to external financing. Probably the most sensible way of testing for such changes is to study intensively a sample of corporations over time. It is *possible*, even if a re-examination of the aggregate data should confirm the absence of a secular increase in the relative importance of internal financing, that this result may reflect a decline in the relative importance of small corporations largely dependent on internal financing associated with a rise in internal financing for large, publicly held corporations.

There are other parts of the study in which Goldsmith, although presumably covering the period 1900-1952, seems to address himself to the period ending with 1949, the termination date of his earlier *Study of Saving*. For example, he refers to the "contribution of financial intermediaries through the acquisition of common stock" as being "small in relation to total common stock financing" (p. 256). Actually, this is true for the period 1901-49 as a whole when the ratio of financial-intermediary net purchases to total net sales of all stock (common and preferred) was 18 per cent, but for the more recent period 1950-52 according to figures he presents the ratio was 68 per cent. Moreover, at the time his study was written, there was every reason to believe that institutions would continue to absorb a major proportion of new common stock offerings, and data for the past few years indicate that well over half of such offerings have been absorbed by financial intermediaries (primarily by private pension funds and open-end investment companies).

<sup>1</sup> *Surv. Curr. Bus.*, Sept. 1957, p. 7 and *Economic Report of the President*, Jan. 1958, p. 183.

Though it is not intended to criticize an author for not doing what he has not set out to do, it may be useful to point out to the prospective reader of this volume that it does not cover such matters as portfolio policies, control policies in relation to portfolio companies, the nature of and instrumentalities of control over financial intermediaries themselves, etc. Goldsmith does make the interesting observation that while "inequality in size distribution (i.e., the degree of concentration) has in all likelihood increased in most branches of financial intermediaries over the last half century . . . it was more pronounced in the 1920's and during the Great Depression than before or after." However, it is difficult to evaluate this statement (at least without reference to an appendix which is not part of the published study) since from many points of view the most interesting over-all statistics indicating the potential concentration of power of financial intermediaries relate to the proportion of claims and equity securities of different sectors in the economy which a relatively small number of institutions own (or otherwise control). These are different from statistics indicating the internal degree of concentration of ownership of assets within the financial-intermediary sector.

In conclusion, I might note that this is not an easy book to read (nor, I suspect, is this review). Thus a careful reader will find that for definitions of many essential concepts, particularly those relating to the national balance sheet, it will be necessary to refer to Goldsmith's *Study of Saving*. (In view of the heavy dependence on his earlier work of some of the less firmly grounded estimates presented—e.g., those applicable to unincorporated business—I have excluded a consideration of estimating errors from this review.) A number of findings cited in the present study are supported in appendixes which are not included in the book. There are some proofing errors which are disconcerting (e.g., percentage increases on p. 133 which are understated by a 100 factor and "internal" for "external" financing on p. 247), but more troublesome are a number of statements which either seem inconsistent with the data or inconsistent with other statements. To illustrate the latter, it is stated that the share of financial intermediaries in the external financing of nonfinancial corporate business "is higher for short- than for long-term financing," but the table seems to imply the contrary is true (p. 184). One also finds on one page (p. 218) that "probably the share of financial intermediaries in total external financing is somewhat higher (outside of railroads and public utilities) for small than for large corporations," but on another (p. 258) the apparently correct statement that "It is probably safe to say, however, that the share of financial intermediaries in total external financing is substantially higher for large than for small nonfinancial corporations other than railroads and public utilities."

In spite of these minor flaws and the other limitations previously mentioned, however, the study is an imaginative, painstaking and useful work which is a must for any scholar interested in financial intermediaries. There are few persons in the profession who could attempt, much less achieve, this masterful treatment of a complex and important body of data.

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*Relations Between the Central Banks and Commercial Banks.* Frankfurt Main: Fritz Knapp, 1957. Pp. 209. DM 24,—.

This book, which is composed of a series of lectures delivered by leading international economists and bankers at the Tenth International Banking Summer School in Garmisch-Partenkirchen, Germany, opens with a discussion of monetary policy. It emphasizes those changes which have occurred since 1948, and examines the influence of the (1) discount policy, (2) reserve requirements, (3) credits granted by commercial banks, (4) rediscount quotas, (5) open-market policy, and (6) policy to be followed by public authorities when depositing funds. The situation in Italy, Switzerland, Austria, France and the Benelux countries is outlined, and the effectiveness of these various monetary policies is evaluated. The authors in general believe that the policies, for the most part, have brought about the desired results.

The reader is given a good picture of the degree of development of the money market—or lack of it—and the effects such development has on the economy. In Germany it is so uncertain a source of funds that no responsible bank manager will allow his institution to become entirely dependent on it. In London where it has two centuries of history behind it, the money market is a compact, informal organization where the size of Great Britain itself makes such a system easy to operate. This is in contrast with the overseas system where it has to be more formal.

In discussing monetary management in the United States, E. Sherman Adams of the American Banking Association, points out that the main objective here is the same as in most countries: to keep the value of money stable; one notable difference is its preoccupation with domestic conditions. In formulating their policies the Federal Reserve authorities can virtually ignore the balance or imbalance of international payments. While other papers had to concern themselves with exchange controls and quotas, the United States representative devoted most of his paper to an analysis of the open-market operations of the Federal Reserve.

Students in this country will be interested in the account of the practice of financing through securities as found in Germany where one and the same institution handles all three kinds of business, namely, deposit banking, the work of the broker and that of the underwriter. Throughout the book abundant examples are found of the tight control exercised over commercial banks by central banks or governments.

In a world in which monetary policy will continue to play a major role in the economies, where it will continue to have a major impact upon commercial bank investments, lesser but still significant effects upon bank lending, and of course, important effects upon rates of return and bank earnings, this book will serve as a good analysis of the way in which monetary policy operates.

Each paper is complete in itself, and the lectures as a unit hold together well. The work is timely, and since the complexities of monetary management will be with us for some time to come—problems which will tax both the economist and the banker—these lectures will be of interest to both.

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*French Banking Structure and Credit Policy.* By J. S. G. WILSON. Cambridge, Mass.: Harvard University Press, 1957. Pp. xiii, 453. \$8.50.

This well-written book will be equally appreciated by scholars and businessmen who wish to obtain a comprehensive understanding of the French financial system. The first part deals with institutions, the second part with the Bank of France and credit controls. In the institutional part, Mr. Wilson, a lecturer at the London School of Economics, fills a gap in the English-language banking literature by giving a concise exposition of the structure of the French banking and financial system, followed by a chapter on each of its components: The deposit banks (of which the largest four were nationalized in 1945); the investment banks (which frequently retain up to one-third of their underwritings); the discount houses (through which the Bank of France carries out its open-market operations); and a variety of public and semi-public specialized lending agencies and money market institutions with their tier of rediscount facilities. Each of these chapters contains a short historical sketch and a description of every major and medium-sized bank and other financial institution. There is a comprehensive analysis of bank balance-sheet accounts and a great deal of other informative detail, including the names of investment banks that have the best connections with the small regional country banks. A discussion of means available to facilitate the financing of exports concludes this altogether well-balanced institutional survey. Unfortunately this part is somewhat short on analysis of the relative functional importance of the various financial sectors in the total economy.

Part II sketches the evolution of the Bank of France and then gives a lucid explanation of the complex of intertwining relationships between the Bank, the National Credit Council and three Ministries of the Executive, all of which have a voice in the formulation of monetary and credit policies. The last quarter of the book contains a survey of postwar monetary and credit policies together with a discussion of the quantitative and qualitative credit controls that have proven so ineffective in preventing a nearly uninterrupted inflationary spiral. The author shows much insight in arriving at his judicious and well-balanced evaluations of the various credit control experiments, always preceded by clear and painstaking analysis.

Wilson attributes much of the 1945-48 inflationary spiral to the policy of reconstruction, as a result of which investment outlays were out of proportion to savings and foreign aid. During this period, credit controls were essentially of the qualitative type. Large bank loans were subject to prior approval by the Bank of France and the commercial banks were expected to exercise discriminating judgment in making smaller loans. The program was ineffective, partly because of the loopholes in the prior-approval program, partly because all self-liquidating loans were entirely exempt from controls, on the fallacious assumption that they were inherently noninflationary. While Wilson points out these and other shortcomings in the techniques of qualitative control, it is doubtful whether any credit controls, no matter how stringent, would have prevented inflation in the absence of a one-time drastic reduction of the war-time-created excess liquidity. The experience of Belgium, Denmark, Germany and Holland seems to demonstrate that the elimination, through currency reform, of the excess money supply is a prerequisite for the re-establishment

of a climate of financial confidence, without which the curse of velocity inflation will superimpose itself on the existing inflated money supply. France's unwillingness to accept the inequalities of such a tax on liquid wealth brought open inflation accompanied by far greater inequities which have undoubtedly contributed to eroding the very roots of the Republic.

After 1948, quantitative credit controls, in the form of rediscount ceilings and secondary security reserve requirements, were the cornerstone of credit policy. Wilson says it "was the degree of elasticity required, particularly during a period of rapidly rising prices, which constituted the chief weakness of the ceiling technique" (p. 400). The causal relationship appears to have been the reverse. The monetary authorities failed to withstand the unrelenting pressures for upward revisions of the ceilings and, through the ensuing credit expansion, prices rose.

This is not to suggest that the author is unaware of the fundamental causes which have plagued the French economy; "For too long France has clung with an ideological tenacity to a system of small and insufficiently capitalized units protected by tariffs, quotas, price supports and State purchases of surpluses" (p. 375). Wilson concludes, "the problem is largely political," and can be solved only by "strong government with widespread support and some prospect of continuing in office long enough for its plans to mature. . . ." (p. 375).

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*Kreditschöpfung und Kreditvermittlung.* By HANS HELLWIG. Stuttgart: Curt E. Schwab, 1958. Pp. 495. DM 24.

Very rarely is monetary theory enriched by a contribution that is both attractively presented and challenging in theoretical content. Hans Hellwig's treatise scores high on both counts.

Its subtitle, "Inquiries into Modern Inflationism" indicates the author's basic objective. He finds an important root of modern doctrines of inflationism in the popular idea of fiduciary credit creation by commercial banks. Whoever accepts this doctrine without qualification, says Hellwig, is prone to accept unlimited government control over credit and banking. Nationalization of credit, however, would merely serve the cause of inflation in the same way as the nationalization of note issue has served it since the evolution of central banking.

The author analyzes numerous modern variations of the theory of credit creation. He finds them wanting with respect to their treatment of the banks' ability to create credit, the limits on credit expansion, and finally the economic interpretation of the process. He especially finds fault with the modern doctrine that creation of bank credit is possible up to some multiple of the bank's reserve position.

According to the author, the credit coefficients which the American literature on banking is so fond of computing are theoretically and practically worthless. Such a calculation not only tacitly assumes uniform behavior of all bankers but also that a bank will extend credit to the extent that its reserves have increased. In reality a banker's reaction depends on many unpredictable

factors. Some of these are the position of the bank within the system, which again depends on its size, liquidity, field of specialization, etc., the economic situation as seen not only by the banker but also by his borrowers, and finally, the credit policy of the central bank which in turn is influenced by its position in the international system.

Hellwig's investigations lend support to the constant denial of bankers that they can extend credit above the limit that is determined by deposits and their own investments. Indeed this denial should disconcert the theorist for if it cannot be proved that the individual bank creates fiduciary credit it is logical to infer that the banking system, too, is incapable of creating credit.

This reviewer is impressed by the cogency of Hellwig's reasoning, such as the following: It is true, demand deposits, which constitute cash holdings at the ready disposal of the depositor in spite of their juristic character as credit to the bank, formally lend themselves to "duplication" through bank credit. The bank debtor receives purchasing power while the depositor does not renounce the power of disposal over his deposits. But how much additional credit is actually created cannot be determined. For we do not know the part of demand deposits that actually constitutes true savings which would make deposits not only juristic but also economic credits to the banks. Furthermore, in order to evaluate the extent of bank credit expansion we would have to know the credit relations between bank creditors and debtors. If, for instance, the depositors are indebted to their suppliers, and the suppliers borrow the same amounts from the banks, we formally may speak of credit creation, but economically the banks merely mediate between creditors and debtors. Finally, we must bear in mind that extensions of credit that follow repayments of old credits do not constitute credit creation, for such a transaction obviously does not enlarge the volume of fiduciary credit.

Whenever the credit volume of commercial banks is enlarged due to an increase in deposits, Hellwig maintains, under certain circumstances credit expansion may take place. But it by no means follows that an increase in deposits is the result of credit creation. For credit creation does not lie in the nature of commercial banking but may result from the decision of depositors to increase their cash holdings with commercial banks. In other words, commercial banks cannot expand their fiduciary deposits even if they are not subject to minimum reserve requirements. Only the central bank can create almost any amount of money and credit it chooses to create and can cause the well-known ill effects of inflation.

This treatise is, to say the least, penetrating and thought-provoking. It demands careful consideration on the part of all serious students of money and banking, especially since its conclusions run counter to the prevailing theory of bank credit. In my belief, it shatters the doctrine of multiple credit expansion which has won almost unanimous acceptance in Anglo-American literature. And it lays a finger on the ultimate source of all inflationary adventures: the central bank. It is to be hoped that Hans Hellwig's work will soon be available also to the English reader.

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*Die veränderte Währungspolitik und ihre Folgen.* By OTTO VEIT. Institut für das Kreditwesen, Johann Wolfgang Goethe-Universität. Frankfurt: F. Knapp, 1957. Pp. 182. DM 13,20.

This study touches on a great variety of subjects of much interest. In an introductory chapter, some major changes in modern economies of the Western world are considered, such as the growing preponderance of money creation by the banks, the increasing public share in the national product, and the diminishing impact of the interest factor on the calculations of the borrower, mainly in view of mounting taxes and of tax incentives for investment.

Then, in a comparison of the Bundesrepublik, the United States of America, and Great Britain, it is explained how central banking has turned to influencing the supply of money more than the demand side by regulating the liquidity of banks through open-market operations and changes in the reserve ratios, instead of mainly relying in the traditional way on the use of the discount rate. Here the surprising statement is made that, because of the lack of an adequate quantity of qualified securities and a developed market for their resorption before May 1955, no open-market policy in the full meaning of the term was possible in Western Germany prior to that date. Further, attention is drawn to developments which in these three countries have latterly led in some degree to the restoration of the discount rate as a major means of monetary policy. This tendency is contrasted with the situation in Switzerland and Sweden, and reasons are advanced for the different attitude of these two countries.

Although references to the matter are to be found, no systematic attempt has been made to describe for the individual countries the limits of the central banks' influence on nonbanking private financial intermediaries, which have everywhere developed so vigorously. Here are some of the most "sensitive points in the financial structure" of many countries, and it is of "the essence of central banking to devise new means of imposing its influence in the direction higher social policy dictates."<sup>1</sup>

While those parts of this small volume which ably deal with the United States and Great Britain may prove useful to the German reader, they contain nothing new to the Anglo-Saxon public; on the other hand, less well-known information as to the working of the central bank in the Bundesrepublik during the past decade is included. This material together with the description of the peculiarities of the Western German banking system and its situation between 1948 and 1957, though somewhat overburdened with detail, will be found most instructive. In this context, it may be interesting to note that the U. S. system of Treasury tax and loan accounts with special depositories is described in some detail (pp. 144ff.) as a good example which ought to be followed in Western Germany to distribute liquidity, as "every money flow in the public sector, exceeding a certain magnitude, is likely to pose problems in the national economy" (p. 143).

Finally, it is pointed out that interest, though not for the rest of the economy, is the decisive cost factor for the banks. On the whole, the concern

<sup>1</sup> As J. H. Power, *Am. Econ. Rev.*, Mar. 1958, 48, 184, so aptly sums up the underlying thought of R. S. Sayers, *Central Banking after Bagehot*, New York 1957, *passim*.

of the banks with monetary policy is stressed throughout so nearly exclusively that, for example, no details are given as to the use made of selective credit controls in the different countries.

Housing finance in the United States and West Germany is discussed at some length; the same might well have been done with respect to Great Britain.

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### Public Finance; Fiscal Policy

*Federal Expenditure Policy for Economic Growth and Stability: Papers Submitted by Panelists Appearing before the Subcommittee on Fiscal Policy, Joint Economic Committee, 85th Cong., 1st Sess., November 5, 1957; Hearings before the Subcommittee on Fiscal Policy, Joint Economic Committee, 85th Cong., 1st Sess., November 18-27, 1957; Report of the Subcommittee on Fiscal Policy to the Joint Economic Committee, 85th Cong., 2nd Sess., January 23, 1958. Washington: Supt. Docs., 1957; 1958; 1958. Pp. xix, 1203; xi, 663; iii, 15. \$3.25; \$2.00; —.*

The Joint Economic Committee has put us in its debt again with its hearings on federal expenditure policy. These hearings, like the companion tax hearings of 1955, provided the occasion for economists to take stock and present whatever knowledge and insight they possessed that would bear on a number of policy problems, in this instance in the field of public expenditures.

The hearings produced three documents, a 1203 page volume of papers submitted by the 97 panelists, a set of hearings, and a brief Subcommittee Report which summarizes many of the conclusions. The volume of papers is an important book in public finance, containing the makings of an excellent textbook on public expenditures, as well as sufficient articles of high quality to fill an academic periodical for a year.

The papers range from reports on extensive new research, to surveys of applicable technical literature, to direct evaluations of policy. The enormous size of the volume makes it rather unapproachable, and so I shall single out a few of the pieces from those that should be of lasting professional interest.

There are two good historical surveys of federal finances. One is a study by P. B. Trescott, covering 1790-1956, which explains the lack of growth of the national government in the 19th century in terms of such factors as the federal system, presidential pressure against new activities, reliance on tariffs for revenue, abhorrence of debt, and finally a set of reform programs which had little cost, such as monetary reforms, antitrust policies and tariff reduction. The other paper, by A. M. Soloway, is a perceptive and detailed account of the last 50 years, tracing the growth of demand for public services and explaining their concentration in the hands of the federal government.

The relation of federal expenditures and revenue to economic stability is explored by Bert Hickman. He shows that federal expenditures are the most

unstable component of the domestic demand for GNP. In an analysis of automatic stabilizers, he finds that the more responsive tax and transfer system of recent years represents a net addition to the stabilizers, with corporate saving remaining as important a stabilizer as it was in the 1920's. To treat cyclical variations in corporate saving as a stabilizer is to consider only the effect on consumption, of course, and ignore any effects on investment.

A paper on defense spending by G. H. Hildebrand and N. V. Breckner underscores the destabilizing effect of the federal government's operations. They find that defense expenditures are determined by the state of international tension and of weapons technology (surely political leadership has some effect too!), and so move independently of the business cycle. Defense expenditures were blameless in the recession of 1949, added to the boom of 1950-53, and were the primary causal factor in the contraction of 1953-54. During much of the recent investment boom, defense expenditures remained constant, though the decline in new contracts during the presputnik economy wave surely helped to touch off the recession. Modern fiscal theory views government as a vast regulator of an inherently unstable private economy. In fact, a fiscal policy which managed to offset the fluctuations in the autonomous components of government demand and their repercussions would be quite a step forward.

A group of papers on atomic energy provides a useful summary of projections and discusses the federal program. P. D. Teitelbaum and P. Mullenbach find fossil fuels in adequate supply in the United States for the next 25 years, at little increase in cost. They bring out that the federal research program is relatively modest: more could be done without interfering with military research, but the program is in perennial peril of becoming embroiled in the private-versus-public power controversy. R. A. Tybout, at the end of a very comprehensive account of the program, wonders whether public aid to private reactor construction is not too generous. The aid consists of a public contribution to the demonstration program, a high price to be paid for the plutonium produced in breeder reactors, granting of rapid amortization certificates, and favorable treatment of the costs in utility rate-making. He suggests that a more leisurely program would develop atomic energy at a lower research and development cost, and still in plenty of time before a national need develops. But he admits that these conclusions may need to be modified by foreign policy considerations. One wonders whether the United States is trying hard enough in this phase of the East-West technological competition.

There are many other papers of note, some dealing with such broad issues as the proper duties of government, the optimal division of functions between federal and state and local levels, general policies to stimulate growth, and the problem of budget reform. Others address themselves to specific expenditure areas, including defense, foreign aid, natural resource development, housing, health and welfare, transportation, and research. On the whole, the group felt that there were pressing needs for further expenditures, particularly for education and research. Not much alarm over harmful effects of government on business was expressed, and there was considerable skepticism about the

virtues of turning functions over to state and local governments. Several papers advocated higher user charges to improve resource allocation.

The record of the Hearings, while frequently stimulating, is not as enlightening. The economists testifying were rather cautious witnesses, and when subcommittee chairman W. D. Mills asked for specific recommendations for expenditure reductions to finance the increased defense outlays, the answers were disappointing; agriculture and the veterans programs were mentioned again and again, with an occasional listing of water resource projects. Yet these are the areas in which it is a political achievement to keep the expenditures from rising. The 97 economists, despite the wide range of their political views, did not prove of much help in isolating areas in which savings might be realized.

OTTO ECKSTEIN

*Harvard University*

*Finanzpolitik—Grundlagen und Hauptprobleme.* By HANS HALLER. Tübingen J. C. B. Mohr (Paul Siebeck); Zurich: Polygraphischer Verlag, 1957. Pp. viii, 326. DM 25,—; paper, DM 21,—.

This is a competent and timely book. It analyzes governmental financial policies (primarily, fiscal policies) in what today is considered their proper context, the economy as a whole. The presentation avoids generalities and goes thoroughly into the analysis of specific measures, without being too closely tied to the economy of one particular country—in this case, Germany. It is, therefore, regrettable that this study is not available in translation for the benefit of more economists, and also legislators.

Approximately one-third of the book is devoted to the formulation of the theoretical basis for fiscal policies. This scholarly attempt to supply a hitherto missing link in economic analysis is mildly successful as far as it goes. But the exclusive application of "model-building" to the analysis remains baffling. Even a brilliant display of some 60 models that visually demonstrate how particular procedures affect the economy cannot perform the miracle of giving life, i.e., the power of creative thinking, to this overworked tool. It merely confirms the evident—and the author's own—expressed scepticism towards its use.

The inquiry itself starts with the exploration of aims of fiscal policies: fiscal soundness, minimum infringement on personal freedom of action, raising the general living standard and, finally, equitable results in the distribution of the national product. It goes on to show the possible conflicts and their compromise solutions. There is a continuous process of adjustment to the ever-changing patterns and valuations of the economic development, i.e., to the dynamics of a free-market economy. Against such a background any rigid concept of fiscal policy and especially of the budget as its central instrument—balanced or unbalanced—would be anomalous. So would any static approach to size or form of the public debt or to any other implement that supports the budget.

This relativity approach gains in significance when the guiding role of the

budget in the economy is considered. Such dominance may well be taken for granted in view of the magnitudes involved. But even then the author sees a choice left in the way this guiding role is acknowledged: either the old notion of the balanced budget may be accepted and a surplus (approvingly) or a deficit (grudgingly) admitted as a consequence of later economic developments; or there is overt planning for a stated kind of budget. The first approach is compatible with the classical principle, the second is not. In both cases, however, the budget expresses fiscal intent; we might term this, somewhat facetiously, an existentialist concept.

In his examination of expenditure and revenue measures, the author distinguishes between policies that tend to stabilize current conditions and those that aim at changing them in the direction of stimulating the economy out of a recession or of curbing an oversized boom. As to the first alternative (stabilization), a certain degree of fluctuation would have to be permissible; but how much, the author does not say. A refusal to permit any deviation from the *status quo ante* puts a rigid budget concept in line with an equally rigid, fully regulated economy. Coming to the selection of means to keep the economy on an even keel, the author favors additional or curbed expenditure, depending on whether the economy is moving downward or upward. He also suggests careful "dosage" of unchanged expenditure totals, by speeding or retarding their use. He even considers anticipating now some spending that was scheduled for the next budget or transferring present appropriations to a later year whenever circumstances demand. Revenue alterations are held to be less practicable; they cannot be effected easily at the required frequent intervals. Monetary policy presents itself as a companion measure.

Changing, however, the direction of the economic trend would entail stronger fiscal and also nonfiscal procedures. In the fight to end a recession, for example, larger additional expenditure, with the strongest multiplier effect, is proposed. Tax reduction, too, is suggested: primarily a reduction of income taxes. Consideration is also given to the possibility of stimulating redistribution of tax burdens that would leave the tax total untouched presumably by a combination of decrease in rates for the lower brackets and an increase for higher ones, or an increase and decrease in exemptions. Monetary measures would more or less go along with the fiscal policies. But if the economy moves in the opposite direction, namely into an inflationary boom, then tax increases and expenditure cuts may not be as readily utilized. Here the author leans more heavily on monetary procedures than in the case of recession<sup>1</sup> although he stresses their impact in that they may make it difficult to stop a downward trend once they have started it.

<sup>1</sup> We may call attention to the Swedish experiment of 1955-56. A 12 per cent tax on industrial investment and a rise of the bank rate were put into effect simultaneously to curb the boom. A year later, the results were checked by issuing a questionnaire to some 3000 companies. The answers showed among other points that (1) 60 per cent of the firms asked carried out their investments regardless of the restriction, and (2) the remaining 40 per cent dropped their plans, partly on account of the levy alone, partly because of the tax and the discount rise; none for the interest rate alone. All in all, the tax proved to be the more effective weapon. (International Monetary Fund, *International Financial News Survey*, June 15, 1956.)

Many other aspects of fiscal policies are analyzed, with regard to the public debt, foreign economic developments, foreign exchange, etc. But one most impressive conclusion stands out: that governmental financial policy emerges as the *one* way to guide an economy without imposing direct controls. Once again, it is implied that Keynes saved capitalism.

HEDWIG REINHARDT

*The City College of New York*

*Federal Lending and Loan Insurance.* By R. J. SAULNIER, HAROLD G. HALCROW, and NEIL H. JACOBY. Princeton: Princeton University Press, for National Bureau of Economic Research, 1958. Pp. xxx, 566. \$12.00.

The purposes, the scope, and the economic consequences of federal lending and loan-insurance programs in recent decades have been such as to merit a comprehensive study of them; and the authors of this book have given the subject practically encyclopedic treatment. Furthermore, the quality of their work is essentially high throughout. This volume may rightfully take its place along with the other major works sponsored by the National Bureau of Economic Research.

The organization of the book is simple and effective. Part I is a summary treatment of all phases of the federal government's program of lending and loan insurance from 1916 to 1953. Part II has three long chapters dealing respectively with the details of the program with regard to three major segments of our economy: (1) agriculture, (2) business and financial institutions, and (3) housing. Lengthy appendixes, made up mainly of statistical data, complete the volume. To each category of loans or loan insurance, the authors apply a more or less uniform treatment consisting of analysis of "Services and Credit Terms," "Credit Experience," and "Impact" (economic effects). The treatment is factual, objective, and temperate.

The analysis of the economic consequences of government lending and loan insurance suggests immediately that students of fiscal policy have been rather seriously remiss in not taking account of such activities in their study of the leverage effects of governmental fiscal transactions. Students of fiscal policy have typically divided their analysis into three parts: (1) spending, (2) taxing, and (3) borrowing. The study under consideration indicates clearly that a fourth category, lending and loan insurance, might well be added to the list. It is true that lending and loan insurance on the part of the government may be thought of as constituting a sort of "conditional spending" and thus in a sense are comprehended in "spending"; but a program of lending and loan insurance differs in so many significant respects from other spending on the part of the government that separate treatment would appear essential to an adequate treatment of fiscal policy. To the knowledge of this reviewer (admittedly quite limited), no writer on the general subject of fiscal policy has given satisfactory attention to government lending and loan insurance as a separate factor influencing the total performance of our economy. The authors of the study in question have provided an abundance of basic data bearing upon this problem and have made a commendable beginning on the analysis of them.

If there be a shortcoming in the study worthy of mention it is possibly the failure of the authors to deal explicitly with the effect of government lending and loan insurance upon the distribution of purchasing power among the people. It is to be suspected, for example, that the incomes of building tradesmen in recent decades have been considerably boosted by F. H. A. loan insurance. Concern with this problem is implicit in much of the authors' analysis, but the question is approached indirectly rather than directly. Inasmuch as the size of one's present purchasing power constitutes an important factor in determining what one will do with any increment to that purchasing power, the effect of government lending on redistribution of purchasing power comes to be a highly significant matter. Further analysis in this direction would appear desirable.

It is to be regretted that the book was not published until 1958. Most of the statistical data end with the year 1953, and therefore some of the material appears a little antiquated at present. This delay in publication seems to have been unavoidable. From another point of view, the appearance of the book is quite timely. That is, we may well see an important revival of government lending and loan insurance in connection with efforts to end the present recession.

TROY J. CAULEY

*The University of Texas*

*Financing Highways.* A symposium volume. Princeton, N.J.: Tax Institute, 1957. Pp. 217. \$5.00.

This brief volume contains fifteen short papers presented at the 1956 Symposium of the Tax Institute and addressed to the problems emanating from the passage of the Federal Highway Aid Act of 1956. The panelists address themselves to the following areas of concern: (1) the charge on the new highway system and the results that can reasonably be anticipated; (2) the reapportionment of fiscal responsibility implied in future highway financing; (3) the role of highway user-revenues in financing the new system; (4) the problems arising out of the use of specific taxes and dedicated revenues; and (5) the methods to "expedite" the highway program. The papers, of course, vary considerably in quality, but the informed lay reader will find intelligent and provocative discussion of the problems associated with bringing the prospective highway program into reality. Those few papers which are disappointing are readily identified as the efforts of state officials to review too eagerly the day-to-day problems of the particular departments with which they are associated.

As a group the panelists stress the importance of integrated planning among government units in the construction of the new highway system in order to avoid unnecessary obsolescence (p. 7) and harassment of metropolitan planning (pp. 8, 9). The cost of highways may run to \$186 billion by 1975 (p. 28) as we prepare for 100 million automobiles. In general the panelists express strong pleas for the increase of state as against federal authority in highway financing—meaning surrender by the federal government of tax sources. A

provocative paper by William D. Ross argues that institutional changes of the last fifteen years (especially consumption-income relationships) mean "the end of the deflation-depression aspect of stabilization programs" (p. 124). Not all of Ross' colleagues will agree with him at this time.

JOHN D. HOGAN

*Bates College*

*Public Finance and Less Developed Economy—With Special Reference to Latin America.* By PAUL A. M. VAN PHILIPS. The Hague: Martinus Nijhoff, 1957. Pp. xvi, 185. f 13.50.

W. A. Lewis complains in his *Theory of Economic Growth* that "there is regrettably very little theoretical discussion of the fiscal problems of underdeveloped countries." Thus, a book on the role of public finance in underdeveloped countries is *prima facie* a welcome addition to the growing literature on the practical policy problems of underdeveloped countries.

Mr. Van Philips presents the fiscal policy problems peculiar to underdeveloped countries in the broader framework of an inquiry into the characteristics, economic as well as noneconomic, of underdevelopment. He also discusses the related issues of inflation and deficit financing. His treatment of the characteristics of underdeveloped economies deviates little from the nowadays commonly accepted view that underdevelopment must be analyzed in terms of social relationships and social forces, rather than in purely economic terms. But he also singles out certain economic peculiarities of underdevelopment: the small stock of capital, the low rate of capital formation, the propensity for inflation, the great dependence on foreign trade which results in instability in general and in unstable government revenues in particular, and a "low effectiveness of monetary policy."

The greater part of the book consists of a discussion of problems of monetary and fiscal policy. A third part is a recapitulation of the main conclusions. These may be briefly set out, as follows: (1) Government and government finance must play an active role in fostering economic growth; (2) The shortage of capital restricts the effectiveness of deficit financing; (3) Increased government activity is a prerequisite for economic development and thus requires larger budgets; (4) Additional tax revenues must be derived from progressive direct taxes because indirect taxes would unfavorably affect the consumption of "the great masses of the poor," while progressive taxes, if used to finance public capital formation, would lower luxury consumption, but not total savings.

This summary obviously is much too brief to do justice to the author who in many places reveals a keen insight into the policy problems of underdeveloped countries. Nevertheless, I find it difficult to accept the main policy conclusion that more progressive taxes would help to solve the public finance problems of underdeveloped countries. I agree with the proposition that there is a place for (moderately) progressive income taxes in the tax structure of underdeveloped countries. But I miss in Van Philips' analysis any discussion of the disincentive effects of progressive taxes, compared with the disincentive

effects of consumption taxes which, incidentally, also may have a moderately progressive incidence (cf. the findings of the Indian Tax Inquiry Commission on this subject). I also feel that the analysis is inadequate because it fails to take account of the incidence of the benefits of government expenditure—on the basis of which I believe the author could have made a stronger case for progression.

Misuse of the English language mars the readability of the book. And I am afraid Lewis' complaint still holds good.

JOHN H. ADLER

Washington, D.C.

*Taxation and Foreign Investment.* By National Council of Applied Economic Research, New Delhi. Bombay: Asia Publishing House, 1957. Pp. vii, 164. Rs 9/50.

The last several years have brought extensive critical examination of and major changes in the taxation system of India. *The Report of the India Taxation Inquiry Commission*, published in 1955 and the Nicholas Kaldor memorandum on tax reform encouraged substantial alterations: a revival of the capital gains tax, new expenditure and wealth taxes, and extensive revisions in individual and company income taxes. The present volume is an assessment of the impact of these changes on the future of foreign investment in India. A considerable research effort went into this study. Questionnaires were circulated among business firms and chambers of commerce; government officials, business executives and accountants were interviewed by staff members of the Council. This research was supervised by P. S. Lokanathan, director general of the Council.

All aspects of the Indian tax system relevant to the conduct of economic activity by foreign nationals are examined here, including such features of the tax laws as their impact on the personal income of technicians, the exemption of home leave travel and the tax treatment of other special allowances for foreign personnel, the burden of company taxation, the tax on improper accumulations, the requirement that companies deposit a part of their accumulations with the government, and the tax burden on nonresident companies.

The authors of the study find themselves in something of a quandary. They would like to stress the concessions that India now makes to the foreign investor and to emphasize that the climate is most temperate for foreign investment in India. But at the same time there are a number of points at which tax burdens appear to be onerous; the authors have emphasized that relief should be forthcoming. On balance the volume conveys the impression that the burden of taxation on foreigners and foreign investment in India is in fact rather severe. This appears to be particularly true of the company tax.

No effort is made in this study to suggest that the total future of India's economic development program depends on successful efforts to attract foreign private investment. The authors pointedly stress that foreign capital has not played a determining role in the industrialization of any great nation. Rather, the approach is to urge temperately that the government look at some of the features of the tax laws which have an undesired, unintended but unfortunate

impact on foreign investment. And the tone is never shrill. In this country students of public finance are accustomed to read that the Congress must repeal taxes that are strangling the free enterprise system. In India the Council writes, "There would seem to be a line of corrective action that might commend itself to Government" (p. 89).

There is one disturbing pattern of comparison in the tax-burden analysis made by the Council: Throughout the volume it is contended that underdeveloped countries are in competition, one with another, for the investments of the capital-exporting countries. Indian tax burdens on foreign investment must not get out of line, it is suggested, with such countries as Burma, Pakistan, the Philippines. This approach to tax policy has long been extant among the American states, and the resulting tax competition for new industry brings on an advanced state of fiscal incapacity. Tax competition among the underdeveloped countries similarly will tend to perpetuate the low productivity of their revenue structures.

JESSE BURKHEAD

*Syracuse University*

*Japan's Finance and Taxation, 1940-1956.* By SABURO SHIOMI. Translated by Shotaro Hasegawa. New York: Columbia University Press, 1957. Pp. xi, 190. \$6.00.

As Carl Shoup notes in his preface, students of income taxation will find much of interest in Saburo Shiomi's study. This is an account of a fiscal system swollen and distorted by war, shattered by defeat, reconstructed by outsiders, and finally revamped by the Japanese themselves in a form more to their own liking. It is partially, from an American point of view, a study in futility and frustration.

Saburo Shiomi, who is professor emeritus of economics and lecturer in public finance at Kyoto University, as well as president of the Japan Tax Association, traces the establishment and development of the income tax in Japan, the adoption of a modern tax system in 1940, the disastrous effect of the war on Japan's monetary and fiscal system, the tax problems of the post-war era, the significant changes in the tax system that occurred in 1949 and 1950 as a result of Shoup's recommendations, and the subsequent efforts (largely successful) of the Japanese to "turn back the clock."

The interest of American readers is likely to focus on Chapter 5, "The Shoup Mission Recommendations" concerned with the tax mission to Japan in 1949 and again in 1950 which Shoup headed. To be fully intelligible, however, Shiomi's chapter should be read along with "The Aftermath of the Shoup Tax Reforms," Parts I and II, by M. Bronfenbrenner and K. Kogiku, in the *National Tax Journal*.<sup>1</sup>

Shiomi is most polite, laudatory and restrained. He says:

I believe that Dr. Shoup's proposed tax reform is a splendid achievement which we can be proud to hand down to posterity. . . . The Shoup tax system is not the American tax system forced upon Japan. It is an ideal

<sup>1</sup> Sept. 1957, 10, 236-54; Dec. 1957, 10, 345-60.

system based on Dr. Shoup's theory, which was made public over ten years ago. . . . A creditable tax system such as has rarely been seen in the history of taxation—an ideal tax system that has never been tried either in Europe or in America—is now being put into practice in Japan. It must be remembered that it will have to be erected in a country having a long tradition and still in a wartorn condition. However desirable a system it may be, it cannot be successfully practiced unless due consideration is given to the prevailing economic and social conditions of Japan. . . . There is no doubt in my mind as to the high ideal of the Shoup tax system; it is the most advanced system in the world. My only concern is how to foster the ideal and make it work harmoniously in this country, where a number of abnormalities still exist. . . . (pp. 90-92).

This is the Japanese way of saying "impractical." Bronfenbrenner is more succinct: "The wonder is less that the Shoup program was modified drastically than that it has survived at all" (*National Tax Journal*, Dec. 1957, 10, 358).

Shoup's objectives were indeed laudable. The progressive and broad-based personal income tax was to be retained and improved as the mainstay of the Japanese national tax structure. Yet successive amendments and changes in the tax have caused such deterioration that the Japanese personal income tax, in Bronfenbrenner's words, "may become in time little more than a disguised payroll tax." The Shoup Mission's effort to secure a reduction in the number and rates of commodity excise taxes and to minimize indirect and consumption taxes, has now been turned aside and reversed. The effort to improve the sources of local revenues, to reduce or eliminate shared national taxes, has been thwarted. The three basic fiscal innovations suggested by the Shoup group—the net worth tax, the accessions tax, and the value-added tax—received short shrift. The net worth and accessions taxes were repealed in 1953 while the value-added tax, whose enactment date was twice postponed, was finally repealed without ever having gone into effect. Other examples of negation could be cited if space permitted.

In the light of these developments, Shiomi's following comment must bring a wry smile to Shoup's face:

The new plan requires careful handling under the circumstances. Hasty enforcement must particularly be avoided. It would be advisable to set up the proper order of application so that the people gradually become familiar with the spirit of the reform; otherwise reactionary factions may spoil it. After all, a big undertaking like this cannot be accomplished in a day (p. 92).

Shiomi comes closest to reality when he says: "It has been commented that, ideal as the Shoup tax system is, Japanese social and economic conditions do not provide a solid foundation for its successful practice. Most business leaders, as well as the academic representatives present, concurred in this view, saying that the system was far too advanced for the Japanese people, whose conservative mind is set on the old-fashioned concept that an old tax is a good tax, a new tax is a bad tax, and that all light taxes are good, all heavy taxes are bad" (p. 98).

Yet even if all his recommendations had been reversed, which fortunately

has not yet been the case, Shoup's work would have served a very useful purpose in stirring Japanese thinking on tax matters, in stimulating a vast amount of public and private debate in Japan on alternative methods of taxation and standards of equity. In similar fashion, Shiom's book may stimulate thinking about the feasibility of advanced fiscal techniques in varying economic environments. It is a pity that this study was not available to Nicholas Kaldor before he made his recommendations on Indian fiscal policy.

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### International Economics

*Théorie et pratique de la coopération économique internationale.* By JACQUES A. L'HUILLIER. Paris: Librairie de Médecis, 1957. Pp. 603. 2,400 fr.

Professor L'Huillier, of the University of Geneva, presents in this volume an informative study of contemporary efforts to promote international economic cooperation. The programs discussed are the General Agreement on Tariffs and Trade, the Marshall Plan and the Organisation for European Economic Cooperation, European Coal and Steel Community, International Monetary Fund, European Payments Union, and the Treaty for the European Economic Community. In each case, the author provides a descriptive summary of institutional arrangements and objectives, followed by an analytical critique.

The inquiry is guided by the belief that "protectionism is less an aggressive doctrinal tendency than a defensive reflex, more or less justified according to the case, in the face of certain fundamental difficulties neglected in classical theory: economic depression first . . . the instability of markets for basic materials . . . and difficulties in maintaining balance-of-payments equilibrium . . ." (p. 555). The argument is that it is misleading to criticize protective measures as though they were arbitrary interferences with what would otherwise be ideal economic efficiency: they are typically responses to pre-existing inefficiency traceable to inflexible domestic economic structures, compounded in the interwar period by deficient demand. It follows that the only realistic way to attack protection is through positive group programs to control aggregate demand, to strike at the roots of internal structural difficulties, and to provide workable payments mechanisms to reduce recourse to controls intended to protect reserves. It follows, further, that "positive intervention" in the market by international organizations may often be preferable to free-market solutions—a position which is profoundly correct in principle and exceedingly difficult to apply in assessing, say, article 58 of the Coal-Steel Treaty.

The author is quite critical of some of the restrictive powers granted to the Coal-Steel Community, but supports the basic approach as facilitating "disciplined progress" in contrast to "the somewhat primitive dynamism of natural selection" (p. 319). He is rather hard on some of the major aspects of GATT and the IMF, and most warmly inclined to the EPU and OEEC. His preference for the latter two blends several considerations: a strongly European

viewpoint and a belief that only a small group of similarly oriented countries can cooperate to the extent of consulting usefully on each other's internal policies; a conviction that programs to reduce trade barriers can only succeed if closely linked to an effective payments mechanism providing international liquidity; and a general conclusion that flexible organizations with few defined powers and correspondingly few specific limitations are more effective than institutions with wide powers spelled out in detail but subject to countless precautionary limitations.

The author does make a number of useful recommendations for improvements in EPU-OEEC practice. Perhaps his most important criticism is that they are unduly reluctant to discuss desirable currency values for individual member countries. Given strong reservations on the desirability of general domestic contraction to correct external deficits, combined with a basic case for low tariffs and restricted recourse to national trade controls, L'Huillier arrives at the eminently sensible conclusion that exchange-rate changes should be high on the list of steps considered in discussing cases of persistent deficits. The advice is well directed: the reviewer remembers well the shocked antagonism generated in OEEC discussions a few years ago (circa 1952-54) by any hint that a specific country might be able to combine more rapid expansion with external balance if its currency value were not regarded as sacred.

The book as a whole conveys a certain atmosphere of an orderly office, windows closed and blinds drawn, the dust and heat of the world shut out to facilitate thorough dissection of the growing stock of official documents. Factual references from sources outside of the institutional reports, and direct statistical verification of quantitative judgments, are definitely minimized. The author provides logical clarity—a most valuable contribution—at the expense of color. That cost is sad but bearable, particularly when the degree of clarity is as high as here. But in two major instances an additional cost, that of a loss of relevance, also creeps in. The brief discussion of exemptions for underdeveloped countries under GATT is sensible but does less than justice to the genuine complexities of the issues involved. The dollar shortage is treated carefully but with more respect for its unyielding structural characteristics than recent history would seem to warrant. The explanations of the shortage are in the past tense (unless my French verbs betray me); the explanations of the case for systematic discrimination against the dollar area because of the shortage seem to refer to the present and future. The bridge between the 1946-50 factual situation explained and the apparently current reference of the case for discrimination is not readily discernible.

One minor point cannot be allowed to pass. To refer to Machlup as an eminent disciple of Keynes (in the application of income theory to international economics) is to confuse the letter and the spirit in a way unlikely to please either of these excellent men.

The enormous range of issues raised in this book precludes thorough investigation. The author is generally excellent at raising the main questions, suggestive rather than conclusive in answering them. The greatest weakness is the insufficient use of factual reference to illuminate the quantitative signifi-

cance of the main factors discussed; the greatest strengths are the author's high order of logical competence and unifying comprehension of the role of positive international planning in promoting an environment favorable for economic efficiency.

JOHN B. SHEAHAN

*Williams College*

*La localización de las actividades económicas en Europa después de la integración unitaria.* By JOSÉ LUIS SAMPEDRO, JEAN CHARDONNET and ANDRÉ THIÉRY. Madrid: Estudios Económicos Españoles y Europeos, S.A., 1957. Pp. xlv, 820.

This is an extremely challenging work. Confronted with the inevitable creation of a European Common Market, the authorities of the Banco de España—the Spanish central bank—decided to conduct a series of investigations into the developments that European economic unification would presumably bring. Six such studies have already been published under the general title *Estudios Sobre La Unidad Económica De Europa*. The study which I am now examining is the sixth of the series. The previous studies are mostly concerned with an analysis and measurement of the various European economies. This one deals with a problem of supreme importance: "How will European unification affect the distribution of industry and agriculture in Europe?"

This study was written prior to the actual coming into being of Euromarket. That explains why some of the developments now in effect under the European economic integration scheme are considered merely as possible in this volume.

The study by Sampedro is by far the longest of the three research projects of which the volume is composed. It occupies over 700 pages. The others are approximately fifty pages each. Originally, the directors of Estudios Económicos Españoles Europeos thought of assigning the task to Sampedro alone. They decided eventually to launch a competition in all the European countries so that the views of other scholars could be obtained on the problem of industrial distribution in Europe following Euromarket. Western Germany was the only country from which no entry was received. From among the manuscripts obtained (the prize was of 150,000 pesetas), the works by Chardonnet and Thiéry were selected.

In anticipating the industrial changes that economic unification may bring to Europe, the authors contemplate four possibilities: (1) a European common market consisting exclusively of the Western European continental nations; (2) a European common market consisting of the whole of Europe, that is, continental Europe without the Soviet Union; (3) plan one plus the United Kingdom; (4) plan two plus the United Kingdom.

In their approach to this problem, Sampedro and Chardonnet—essentially Southerners—take views which are favorable to the southern economies; whereas Thiéry, a Northerner, seems to opine that economic unification would benefit mostly the northern economies.

The argument of the Spanish contributor, Sampedro, runs basically as follows: 19th century coal and steel industries made the area between the North Sea and the Alps the foremost industrial and economic center of

Europe. This is the industrial Lotharingia situated in the basins of the three great rivers, the Rhine, the Rhone and the Po. Euromarket will not change the importance of this zone. As a matter of fact, it is quite possible that this great industrial triangle will add to its present economic power. However, the economic unbalance which will become intolerably apparent after unification—the proximity of the southern economies to North Africa and the oil wealth of the Middle East, their extremely favorable Mediterranean position and their abundance of competent workers—are all factors which are bound to stimulate investment in and growth of the southern regions (essentially southern Italy and Spain), which eventually will proceed at a higher rate than that of the more industrialized northern areas. Sampedro corroborates his reasoning with an abundance of statistical information.

The French contributor, Chardonnet, ventures the opinion that, as long as Great Britain remains outside the European common market, the changes within the market will be essentially industrial changes and not agricultural changes. Should Great Britain join the market, that would mean the collapse of British agriculture and a powerful stimulus to European continental agriculture. Northern Western Europe will continue, after unification, to exercise its position of industrial leadership in Europe, especially if Britain becomes a member of the union. However, there is no doubt that the strengthening of the northern industrial belt will by necessity result in efforts toward the industrialization of the southern regions, namely southern Italy, Spain and North Africa. The mineral resources of these territories have not yet been fully explored, their capability of being lifted to much higher levels of economic well-being is substantial and their geographic position is extraordinarily valuable.

Chardonnet advances the view that, should the Soviet satellites join the European market their economies will have to pass through a painful period of adjustment. This is due to the fact that a substantial part of their industrial growth is largely artificial as it is stimulated by the supply of Russian raw materials and dedicated to the objective of strengthening the Soviet economy.

Thiéry, the contributor from Luxemburg, is a pessimist as far as the Southern European territories are concerned. He thinks that, if nothing is done, the industrial northern areas will become even more industrialized as a result of Euromarket and the southern regions will sink even deeper into industrial lethargy. He advocates that funds be made available to the less developed southern regions, that administrative decentralization on a federal basis be undertaken and, finally, that Euromarket be made to transform itself into a constitutable Euronorthafrica.

I have said that these studies preceded the actual creation of the European Economic Community. One can see now how farsighted the negotiators were when they included in the treaty a vast project for investment in and industrialization of important areas in North Africa.

One thing more should be said about Sampedro's work. In his study, he examines the fiction of a United States of America hypothetically disunited from its very beginnings and of how the industrial growth of the United States would have proceeded had such disunity been maintained.

This series of essays on European economic integration originating in Spain, a nation which is not yet a part of Euromarket, powerfully attests to the vigorous awareness in Spanish political and economic circles of the importance of this problem for Spain, as well as to the high degree of achievement attained by Spanish economics scholars.

CARLO MARIA FLUMIANI

*Boston College*

*Die Grundlagen der Aussenwirtschaftstheorie.* By ALBRECHT FORSTMANN. Berlin: Duncker & Humblot, 1956. Pp. xvi, 418. DM 32,00.

In this remarkable book an effort is made to formulate a new theory of the complex structure of international economics. The first of the five chapters is devoted to the problem of international economic theory, followed by a description of the "classic" foreign trade theories, and a theory on the adjustment and equalization of regionally unevenly distributed production factors. The author shows in detail the development of the various structural types and the trend towards the optimum combination of productive factors in all types of economies. After demonstrating the relationship between international trade and foreign exchange, Forstmann takes great pains to explain exogenous influences conditioning the changes in international economic relations, especially in regard to the economic situations after the first and second world wars.

The author recognizes the historical primacy of the classical international economic theories. He accepts in principle the theories of comparative cost and of the balance of trade, but not without the modifications necessary to meet, as he sees it, the realities of modern economics. In this connection, moreover, he offers his theory of unilateral transfers of value, which is caused, at least basically, by exogenous influences. Such unilateral action is shown in exports of goods and services without reciprocal imports, and vice versa. This produces a disequilibrium of the balance of trade, favorable or unfavorable, which has to be offset in the balance of payments by active "alimentary" payments. Forstmann attributes this situation to technological changes which have created production capacities in advanced countries surpassing domestic demand. The producers have been forced to find new markets abroad to utilize the available capacity fully and to satisfy the need for employment.

In the development of his thesis, Forstmann strongly rejects the opinions of Marx and condemns any policy of self-sufficiency as economically illegitimate. To some extent his attitude is anti-Keynesian and its trend is to accept or come close to accepting the teaching of Wilhelm Röpke.

At the end of the book, the author once more reiterates in summary the necessity of adjusting and of equalizing the uneven regional distribution of production factors. This equalization, in his opinion, can only be achieved by unilateral transfers of value, whereby the best utilization of productive forces is obtained and the general welfare of all nations is best served. He rejects counterarguments which say that international economic relations should be

restricted to the exchange of goods as the only way of "democratic foreign trade policy" to assure equality and sovereignty among nations. The development of the so-called underdeveloped countries requires foreign capital and Forstmann calls the arguments that such capital transfers would endanger the independence of the receiving nations pure "nonsense." He points out that nobody could say that the sovereignty and standing of the United States was lost or suffered under the capital inflow and foreign investments which made it the greatest debtor nation of the world prior to the first world war.

Forstmann's arguments are not always convincing and some of his conclusions are not completely acceptable. The international division of labor is not quite as easily explained as the author tries to do. It seems rather likely that overproduction would lead first to an attempt to increase domestic demand by price reductions before resulting in unilateral transfers of goods and services for which payment could be made by capital export only. The second law of Gossen could be applied only if returns for such capital transfers should be attractive enough. In fact capital movements are often politically motivated and oriented in modern times. Also, if they are not outright grants, there will always be the problem of repayment, for which the author offers no direct solution.

To some readers, at least, the book will seem complicated by long and excessive footnotes and repetition. The volume nevertheless makes interesting reading in a field where divergence of opinion is constant. It can be argued whether the author has succeeded in his endeavor, but most of the readers will agree that his presentations are provocative and challenging.

LUDWIG H. MAI

St. Mary's University

*International Trade: Goods, People, and Ideas.* By WENDELL C. GORDON.  
New York: Alfred A. Knopf, 1958. Pp. xix, 647. \$6.75.

Professor Gordon's book is a textbook and a good one. But it is not a textbook in international trade, as one might infer from its title. Rather, it is an attempt "to integrate current thinking in the field of international economic relations into a coherent whole." If one feels that the first course in international economics should be something more than a pass at history of thought from the mercantilists, a good dose of theory and related commercial policy, with a final chapter on international institutions and maybe economic development, this book will be a welcome addition to the shelf of choices. My inclination is along these lines; for those who prefer more traditional fare, Gordon has little to offer.

As one might expect, trade theory à la Haberler and à la Machlup gets short shrift; this is not personally objectionable as plenty remains to occupy the undergraduate, perhaps of considerably more importance and certainly of more interest. This is more than a minor shift in emphasis; the course for which Gordon writes (and for most institutions a new one) should be called *Introduction to International Economics*. This presumably could be followed

by courses in trade theory, international finance, economic development, and/or area studies for those who want to specialize.

In terms of level, the author has chosen wisely. Extensive ability to use analytic tools is not required but the student is expected to have gleaned more than a little from his principles course.

Another striking innovation in this book is the moral tone vigorously pursued throughout. Chapter I starts with "the dogmatic assumption . . . that the human race . . . is trying to bring about, or should be trying to bring about, that combination of (a) higher material level of living, (b) greater individual freedom of action and expression, and (c) increased security, which the race considers most desirable" (p. 4). From time to time, the discussion seems far removed from this assumption, but for the most part these objectives are repeated often enough to remind the reader of the author's system of values.

The foregoing objectives are particularly significant to the policy conclusions reached and which follow reasonably well from these values. They are stated well and with considerable courage. Only then will the student see the implications of accepting Gordon's values. If nothing else, the desirable objective of student soul-searching should result from recommendations for a common international currency, unhampered migration of peoples between nations (nations, themselves, are dispensable so far as Gordon is concerned, I gather), international incorporation of firms doing business across national boundaries.

Students will also find the style and format pleasing. Dry humor (e.g., Texan Gordon, speaking of the embargo on chilled and frozen beef, says "This being a fighting issue in the cattle country, perhaps the less said about it the better" [p. 208]) leavens this rather large loaf. Specifically, too, students will find interesting, interspersed discussions of Marxism and its application (or misapplication) by the Soviet Union to various cold-war issues. Hobson, Veblen, and Ayres also are woven into various parts of the discussion.

Some of the policy recommendations are personally unacceptable. Other than these, which cannot be here detailed, there are two minor criticisms: (1) The book is too long for a quarter course and perhaps even for a semester course. It demands ample time for careful classroom discussion. The length develops not so much from too many subjects but from more exhaustive treatment than some deserve. Five pages devoted to "travel and passports" (pp. 569-73) is more a pamphleteering venture than judicious allocation of space. (2) I was frequently irritated by references to unidentified people of whom I had never even heard. A good many of those cited were qualified by personal knowledge, but to most juniors and seniors these would be a mystery—and not one they would likely try to solve for themselves. The author should have included as a part of his educational responsibilities the identifying and qualifying of his cited authorities, or not have bothered to include their names.

JOHN M. HUNTER

*Michigan State University*

*International Finance.* By CHARLES N. HENNING. New York: Harper & Brothers, 1958. Pp. xix, 481. Text ed., \$7.50.

This text is designed, so the author notes in the preface, "to integrate in one book the discussion (1) of practices used in financing foreign trade . . . and (2) of theory and problems of international finance." It is intended to be suitable both for business courses in techniques and procedures and for economics courses concerned with the basic problems of international finance.

To attempt both of these discussions in a single volume, even one of nearly 500 double-column pages, is certainly a bold undertaking; however, the product is in some respects quite satisfactory. On the one hand, the descriptive sections deal with the materials in substantial detail and present recent developments in financing foreign trade with clarity and thoroughness. On the other hand, much of the difficult analytical materials, that constitute the core of courses in economics, are treated rather summarily. For instructors who emphasize the broader problems of international finance the allocation of space will probably not be to their liking, but for those who want a thoroughly readable presentation of practical methods of finance this is probably the best book available. Most of the texts in this field include both the descriptive and the analytical materials to one extent or another, and the amount of time devoted to various subdivisions of the subject must depend finally on the tastes and interests of the instructor and on the objectives of the course. It is well to have texts available with each emphasis, and this one should prove a useful addition, both as a text and as a reference.

The introduction contains, in addition to the usual opening remarks concerning the scope and plan of presentation, the only chapter which offers a systematic treatment of the balance of payments. Like much of the book, this chapter is largely in descriptive terms and includes discussions of the double-entry nature of the balance of payments, its relation to both business and social accounting procedures, and problems involved in compiling estimates. There is a great deal here that will contribute to the understanding of the undergraduate in either business or economics. One might wish, however, that some place the author had developed the balance of payments as a significant tool of analysis, for there is much in the later sections which could have profited by such an addition.

Part II, "Procedures and Practices," is a descriptive section in which a large number of the credit instruments used in foreign-trade financing are explained in detail. More than 75 pages are devoted to the letter of credit—the forms it may take, the responsibilities of participating parties, and problems of uniformity. Many specimen are reproduced; more, it appears to this reviewer, than are necessary in view of the detailed explanations. This section of the book could perhaps be a valuable reference for businessmen who wish to expand their knowledge of alternative credit devices or for courses which do not include much descriptive detail. But good reference books sometimes present problems when it comes to teaching from them, and this difficulty may be encountered in working through the plethora of detail included.

Part III, "Institutional Operations," explains well the roles of commercial

banks and other institutions participating in the exchange market. The analysis of the various quoted rates and the operations of the New York exchange market are among the topics which receive excellent treatment. In addition to accounts of sources of, demand for, and methods of handling acceptances and drafts, a short chapter is devoted to forces determining the rate of exchange. Unfortunately, its brevity prevents the chapter from adding significantly to the discussion and it might better have been included in the last part along with other theoretical discussion.

The final section, of just over 100 pages, covers most of the materials under the heading "the theory and problems of international finance." The usual subjects are discussed including the dollar shortage and convertibility, exchange problems following both recent wars, international investment, and economic development. For so short a discussion, a large number of subjects are considered and reference made to many important contributions. However, unless the students are well-grounded in the literature or have more than average eagerness to pursue a large volume of outside sources, this section could prove difficult and confusing. For example, the author examines the arguments of Gottfried Haberler, Thomas Balogh, and Charles Kindleberger on the dollar shortage, all within slightly more than one page. When the treatment here is compared to the detailed explanation of the mechanics of the letter of credit one can justifiably argue an unevenness of the level of presentation. Fortunately, the book is generously footnoted and excellent reading lists and problems follow each chapter, but these are probably not sufficient to make the last section useful without considerable supplementing.

M. D. WATTLES

*University of Oregon*

### **Business Finance; Investment and Security Markets; Insurance**

*Investissement et financement. Origine et emploi des fonds de grandes sociétés.*

By MARCEL MALISSEN. Cahiers de la Fondation Nationale des Sciences Politiques, No. 88. Paris: Armand Colin, 1957. Pp. 215. 1.600 fr.

The introduction to this book points out that the problems of output and employment are related to those of economic growth. The intent of the author is to discuss why and how firms invest and grow in a developed economy. Considering the investment and financial behavior, during the years 1949-1955, of 53 French firms holding  $\frac{1}{2}$  of gross physical assets of stock-issuing corporations, he concludes that the firms financed most of their investment from internally generated funds, retained earnings and depreciation, rather than through the capital market. This practice leads to variations of gross investment which magnify the problems of fluctuation in the French economy.

During periods of full employment and rising prices, the firms absorbed short-term funds which they repaid during periods of recession. To prevent this, Malissen suggests that short-term credits be more effectively rationed during periods of full employment and that medium-term credits be made more available during periods of low activity. For such a program to be effective, cooperation of businessmen and recognition of their social responsi-

bility are seen as a precondition. This exhortation and specific requests for particular monetary policies summarize the major policy recommendations of the concluding chapter.

Essentially, Malissen's procedure is to consider the 53 firms as a whole and by groups corresponding to 6 industrial classifications (steel, aluminum and nonferrous metals, metal working and machine tools, automobiles, electrical equipment, cement, and chemical). Data were obtained from the published balance sheets of the firms and from reports to the stockholders. Sales figures or other measures of activity for individual firms are obtainable for a small but increasing number of companies. Flow variables were obtained by converting balance sheets into statements of sources and uses and taking first differences. Assets were revalued by the firms at various times to adjust for inflationary changes. Further adjustments are made by the author to correct all sources and uses of funds for price changes.

Problems associated with the accuracy of data are not overlooked, but they do not prevent him from asking and attempting to answer questions which could not be meaningfully answered with the available materials: Do consumers, workers, and stockholders gain or lose from the policy of financing investment out of retained earnings? Did firms gain or lose from the inflation as a result of inventory speculation? Is the relationship between the total stock of capital and level of capacity output linear?

Elsewhere, Malissen examines the relationship between gross investment and the level of activity and obtains high correlation coefficients, but he neglects to present any measures for the reliability of his regression coefficients. In view of the problems which other economists have had in attempting to explain investment as a function of a single variable, it is difficult to understand this omission as it is to interpret the results.

A great deal can be gained from analyses of investment decisions for particular industries. The author is to be complimented for attempting this study in the face of the many problems of obtaining information. When his analysis is confined to questions concerning the relationship between variables or methods of measuring changes in real variables, he has much to say that is of interest.

There is very little discussion of the capital markets, the nature of which is closely related to the problems discussed and the recommendations made.

ALLAN H. MELTZER

*Carnegie Institute of Technology*

**Business Organization; Managerial Economics;  
Marketing; Accounting**

*Selling in Our Economy: An Economic and Social Analysis of Selling and Advertising.* By HARRY R. TOSDAL. Homewood, Illinois: Richard D. Irwin, 1957. Pp. xi, 333. \$5.00.

In this interesting volume, Professor Tosdal, now in emeritus status, presents an appraisal and rationalization of selling based upon his more than 35 years of teaching and writing in the field of sales management at the Harvard

Graduate School of Business Administration. The jacket blurb suggests that the writing is aimed more largely at sales and advertising executives than at academic scholars. Teachers and students of marketing together with many economists will, however, find much of interest in this mature expression of judgment by a leading scholar in this field.

Selling is defined as "persuasive leadership to bring about buying action" (p. 10). Repeatedly selling is characterized as an energizing influence or "energizer" for a high-level economy. The rationalization runs as follows. Although selling is exercised on behalf of sellers, its ultimate objective and impact is to enhance material welfare and make for high and rising standards of living. Consumer demand, however, is the central "energizing force" in the American economy (p. 51). Selling influences consumer demand so that it is not merely a "vague general desire" but a "specific dynamic force, a moving desire for improvement as embodied in specific material goods and resources" (p. 51). Although there is some buyer-initiative "our present economic system is predominantly based on seller initiative in producing and distributing goods" (p. 243).

It is further contended that production and distribution based on aggressive buyer initiative could not serve the public welfare as well as our present seller-energized system. "More human energy and time would be required" (p. 251) to make the minimum contactual relations, and the beneficial impacts of selling upon innovation, invention, technology, economies of scale and productivity in general would to a considerable extent be lost.

Tosdal does not overlook abuses, limitations, and possible correctives. Nor does he contend that selling unaided accomplishes the miracle of high and advancing prosperity and standards of living. Natural resources, man-power and a favorable economic and social climate also play their parts. His basic contention is simply that "selling effort is the energizer of our economic machine" (p. 328); and "a chain reaction is started that energizes the whole economic system" (p. 323). Without sellers' persuasive leadership desires would not be intense enough to maintain and advance a high-level economy.

Economists will be especially interested in the chapter on "Selling and Economic Theory" which opens with the statement: "With few exceptions professional economists do not recognize selling as an important economic function" (p. 265). He explains that alleged "neglect" or indifference in terms of (1) lack of personal contact with much of selling, (2) basing judgments upon abuses in selling, (3) antagonism to endeavors to influence buying, (4) the illusion that people act rationally, (5) the exclusion of psychological motivation from economic analysis (pp. 265, 266) and (6) "the persistence of the feeling among academic men that 'trade' is not quite respectable" (p. 269). In spite of occasional references to recent writings it seems evident that Tosdal's reaction and discussion is oriented too largely to the literature of earlier decades.

It seems evident, too, that some of the more recent writings have tended to make him, perhaps, overly sensitive to criticism. Academic scholars in the field

of marketing and selling do feel at times that they are carrying a form of white man's burden on the fringes of economic analysis! It is to be regretted that Tosdal did not take the opportunity to relate his own interpretation more rigorously to recent and current developments in the theory of monopolistic competition, product differentiation, selling costs and market power and control. Perhaps it was believed that such analysis was inappropriate to a volume aimed primarily at an audience of business executives. But there are bows in the direction of the recent literature, including specific reference to "imperfect" or "monopolistic competition" and selling and market control. Further, there are numerous generalizations concerning the role of selling in a free-enterprise economy and public regulation that could be related directly to the sizable body of literature. Tosdal chose to define selling narrowly in such a way as to force him to deal directly with the aspects of market transactions usually under most criticism; viz, the persuasive leadership impacts. But this is also, to a considerable extent, the terrain of the economic analysis of product differentiation and selling costs, and of important issues in the endeavor to maintain effective competition in our markets. It would, of course, be quite a task to come to grips with this large literature and admittedly would have introduced a different note into the writing.

Furthermore, the emphasis selected by Tosdal would have provided opportunity for reference to a widely different but important body of emerging concepts, notions and exploratory research. Individual and group processes that result in buying decisions are being illuminated by studies of search behavior by consumers, influence patterns and learning theory. Such approaches are intellectually rewarding and challenge economists to incorporate their findings into models of economic behavior. Tosdal does mention in passing the Katona and Likert studies of consumer behavior (p. 60).

Tosdal also avoids the drama and interest involved in some of the grand strategy and conflicts in marketing and selling. The reviewer agrees that marketing in the American economy is basically seller-oriented, especially by manufacturer-sellers. One must agree, too, that thus far in this country, the consumer cooperatives have been relatively minor factors. Undoubtedly, too, there would be a net loss of innovative spark and persuasive zeal if our marketing system were completely buyer-oriented. On the other hand, Tosdal, in this reviewer's judgment, tends to understress the actual and potential influences emanating from consumer-buyers and professional buyers. Further, he overlooks the significance of the basic clash in American marketing between the aggressive programs pushing downstream from the manufacturer level and those reaching upstream from the retailer-consumer end of the marketing channel.

Regardless of differences in view or of wishes for additional analysis or variation of stress, one must be grateful to the author for a clear-cut exposition of his thesis.

E. T. GREYER

*University of California*

**Industrial Organization; Government and Business;  
Industry Studies**

*Monopoly Problems in Regulated Industries—Airlines. Hearings Before the Antitrust Subcommittee of the House Committee on the Judiciary, 84th Cong., 2nd Sess., Feb., Mar., May, June, 1956. Pt. 1. Washington: Supt. Docs., 1956. 4 vols.*

The four volumes of the Hearings, dealing with monopoly practices in the commercial air transportation industry, contain much superfluous and repetitious information which makes them both difficult and burdensome to read. Too often minor points are overstressed in hopes of bringing to light irregularities to the neglect of more significant and fundamental issues. Diverse opinions are brought out in the testimonies presented by witnesses representing the domestic scheduled and nonscheduled carriers, international carriers and related activities, federal agencies, travel bureaus, ticket agencies and trade associations. Testimonies were heard also from academic specialists in the field of air transportation.

The primary objective of the Subcommittee was to investigate the extent to which the Civil Aeronautics Board had or had not exercised the powers vested in it by Congress to prevent the growth of monopoly practices in the commercial air transportation industry of the United States. It was essential for the Subcommittee, in the hearings, to examine many of the basic problems confronting the industry.

One of the problems centered about the power of the Civil Aeronautics Board to restrict entry into the domestic trunkline operations. This was subjected to extensive and searching examination by the Subcommittee in its effort to determine the extent to which this policy, as interpreted by the Board in its decisions, had caused the exclusion of new and eligible applicants and nonscheduled carriers seeking such operating rights. This issue involved the extent to which the actions of the Board in entry cases had prevented the development of constructive competition as intended by Congress in the Civil Aeronautics Act.

The Subcommittee endeavored to determine if the members of the Board had been influenced unduly in their decisions by pressures from large air carriers and, if so, the extent to which the effectiveness of the Board had been impaired in carrying out the intent of Congress with respect to the antitrust laws.

The question of which federal agency had primary jurisdiction over anti-trust policies as related to commercial air transportation was raised in the hearings. The Subcommittee was concerned if the lack of clarification as to primary jurisdiction had made for judicial noninterference and, if so, the extent to which this had resulted in providing immunity from antitrust laws and the superseding of these laws by the regulatory rulings of the Civil Aeronautics Board.

Considerable time was given in the hearings to the manner in which the Board had exercised its rate-making powers. This was to be expected in view of the fact that the Board had not carried out a formal passenger fare investi-

gation during the seventeen years of its existence, and had canceled a proposed passenger fare investigation under rather unusual circumstances.

The four volumes of the Hearings provide a useful and ready source of information for those who are interested in the basic problems underlying the development of effective regulatory policies in the commercial air transportation industry in the United States. They serve to bring together a wide range of pertinent facts and opinions, including diverse viewpoints, statistical data, leading cases and decisions, special studies and reports.

J. C. D. BLAINE

*University of North Carolina*

*The Regulation of Rail-Motor Rate Competition.* By ERNEST W. WILLIAMS, JR. New York: Harper & Brothers, 1957. Pp. ix, 247. \$4.50.

In 1935 Congress passed the Motor Carrier Act (now Part II of the Interstate Commerce Act). This Act gave to the Interstate Commerce Commission regulatory powers over motor carriers as well as railroads.

Williams' purpose is to evaluate the Commission's performance in exercising its authority over both sides of intercarrier competition since 1935. This evaluation is made by analyzing the substantive content of reported ICC decisions relating to the rates of the two types of carriers. He raises questions concerning the adequacy of the Commission's performance, and offers suggestions for improvement therein.

Chapter 1 suggests the nature of the regulatory difficulties posed by the emergence of a motor transport industry of different economic structure, and with different public responsibilities, from those of the railroads. Also discussed briefly are the provisions of the law presently relating to intercarrier competition, and the manner in which the Commission exercises its authority over the rates of the two types of carriers.

Chapters 2 and 3 are concerned with the lawfulness of "motor-compelled" rates established by the railroads in the exercise of their right to meet competition. In addition to other factors affecting their lawfulness, such rates must be no lower than is necessary to meet competition, and must be "compensatory." "Meeting competition" generally has meant rates on a par with the competitor's rates (except where the rate is meant to offset service differences). The Commission has stated no general rule for determining when rates are "compensatory." The circumstances of the individual case apparently govern the decision.

Chapter 4 deals with Commission decisions on railroad requests for fourth-section relief (relief from the long- and short-haul provisions of the law) in setting rates designed to meet motor-carrier competition. Chapters 5 and 6 are concerned with the Commission's control of motor-carrier rates—Chapter 5 with decisions regarding the lawfulness of such rates, Chapter 6 with the Commission's (sparing) use of its power to establish motor-carrier minimum rates. The Act states that regulation of the two types of carrier is to be conducted so as to preserve the "inherent advantages" of each type. Chapter 7 is concerned with the difficulties the Commission faces in determining the "proper" relation of the rates of the two carriers in light of this mandate.

The final chapter appraises the Commission's performance and suggests improvements which it is believed would make for a constructive Commission policy. In Williams' opinion the Commission has taken a negative view of its responsibilities—it has been reluctant either to act on its own initiative or to set policy. While, from an economic standpoint, the public interest would require that any given transport function be performed by the low-cost carrier, the Commission apparently has attempted to maintain each carrier in the full range of services it occupied at the time the Act was passed. The Commission has not knowingly forced either type of carrier out of any segment of transport by the exercise of its rate power. Williams believes that the Commission should be more willing to set policy and should, in its decisions, balance the value of maintaining alternatives for shippers against the advantages to be obtained from concentrating traffic on the low-cost carrier.

The readability of the book is reduced by the extensive use of material quoted directly from ICC decisions. The result, at times, is that the significant points become lost in a mass of quoted detail with the reader left wondering, "Who's on first?" Considerable improvement would have resulted if much of this material had been relegated to footnotes, with the body of the text used for more concise development of the points the author wished to make.

Williams states that it is not his purpose to "attempt here any extended discussion of the economics of either rail or motor transport" (p. 7). The result is that, while economic considerations are touched upon, very little economic analysis is undertaken. It is stated, for example, that although the economic character of the motor industry is such as to suggest the possibility of workable competition, there has been no tendency for the industry to reach an equilibrium when unregulated (p. 225). No real analysis is undertaken, however, to explain why (or if) this is the case.

The book will be of little interest to those concerned with applying the tools of economic analysis to the problems besetting the nation's transport industries. It may be of some use as supplementary reading material in certain transportation courses where the purpose is to impart to the student an understanding of regulatory procedures.

J. F. BARRON

*University of California, Los Angeles*

*Motor Transportation.* By WILLIAM J. HUDSON and JAMES A. CONSTANTIN.  
New York: Ronald Press, 1958. Pp. ix, 703. \$7.50.

The authors of this comprehensive volume state in the preface that they have designed this book for college students and for motor-carrier personnel and industrial traffic managers who want a clear understanding of the problems and policies involved in motor-carrier operations. To a considerable extent this goal has been accomplished. However, members of each group who use the book for their own special needs may wish the authors had been less ambitious. For example, much of the detail relating to operations is not suitable for college use except in the most specialized type of course.

The early sections relating to the development of the modern highway system are especially strong, analytical, and soundly annotated. The authors put

particular emphasis upon highway development as basic to the motor-transport industry, an obvious point, but one often overlooked by writers who treat the highway problem in a more detached fashion.

It is also refreshing to note the relatively brief treatment given to the early development of the technological aspects of motor transport. The authors apparently recognize that the student will have had ample opportunity to become familiar with these developments through general reading or through previous courses. Part I also contains an exhaustive analysis of the place of the motor carrier in the social and economic organization of the nation. As in certain other portions of the book, the material relating the motor-carrier industry to various social and economic functions seems an unnecessarily detailed reiteration of the obvious.

Part II, *Motor Carrier Operations*, begins with an analysis of the economic characteristics of the motor-carrier industry. The authors state that they have tried to keep this section broad in scope in view of the wide diversity of motor-carrier operating procedures. This part of the book is weakened by the necessity of describing operations in sufficient detail to be useful for general students, while at the same time including material of value to motor-carrier personnel. Neither group is likely to be completely satisfied, and it is probably impossible to reconcile the needs of both groups in a single text.

While the economic characteristics are set forth in a workmanlike manner with suitable graphs and charts, the space devoted to this important area is equaled by that devoted to the selection of equipment and by the area discussing terminals and materials handling. From the standpoint of classroom use, one might wish that more space had been devoted to an intensive analysis of the economic factors at the expense of some of the more obvious operating problems. The remainder of Part II is devoted to an analysis of motor-carrier operations, most of which apparently was written with motor-carrier personnel in mind. The scholarly appearance of this section is somewhat impaired by the illustrations, some of which seem hardly suitable to a college-level text. The chapters on liability and claims and on freight classification and rates are both well done, although much of this material will represent duplication for students of transportation or traffic management. While Part II contains interesting material not readily available in any other single source, it is likely that considerable screening would have to be done in order to use the text in college-level classes.

Part III, devoted to motor-carrier regulation, is perhaps the most valuable portion of the book and could be profitably used to supplement regulatory material in any transportation course dealing with motor carriers. The discussion relating to the regulation of contract, private, and exempt carriers is especially useful in relation to the latter two categories. It includes a gratifying amount of recent material concerning the policies and problems of private and exempt carrier operations. The authors are especially to be commended for their treatment of the relationship between federal and state motor-carrier regulation.

The book is useful and well written. The emphasis placed upon motor-carrier operations and managerial problems makes it more useful for training of motor-carrier personnel than for college students in the typical under-

graduate course. The extensive annotation and the use of recent data make the book an invaluable tool to those who wish to investigate some facet of motor transportation in more detail. From this standpoint it would be a useful addition to the library of transportation students and economists interested in the general field of transportation.

HUGH S. NORTON

*University of Tennessee*

*Public Utilities in American Capitalism.* By MARTIN G. GLAESER. New York: Macmillan Co., 1957. Pp. xiii, 624. \$7.50.

This text reflects Professor Glaeser's many years of learning, writing, and teaching in the field of public utilities. But he goes beyond the conventional utilities such as electricity, gas and communications, and also treats the transport agencies. Many, although not all, of the problems of regulation are the same, and a large measure of economy is effected by dealing with public utilities and transportation in a single volume.

The subject matter is developed under three broad headings: economic and institutional foundations, administrative aspects of public utility regulation, and planning and coordination. Using an institutional and historical approach in the tradition of John R. Commons, the author traces the technological and economic development of each of the industries and the evolution of public control within each of three time periods—the promotional epoch to 1860, the competitive epoch to 1900, and the monopolistic and planning epoch in the twentieth century. While the dominant characteristic of each period is thus emphasized, the discontinuity in the treatment of individual utilities leaves something to be desired. Supplementing the historical chronology, although not abandoning the method completely, are interesting chapters on our energy economy, the life history, accounting and financial aspects of "going concerns," the evolution of the public utility concept and the control of the market, and the constitutional basis of public utility regulation. The author leaves little unsaid concerning the roots of public utility enterprises and the growth of legal doctrine. He finds that the essence of the public utility problem from the institutional point of view "resides in the degree of essentiality of the service and the degree of control of the market accorded a given concern" (p. 233). With the emphasis upon the monopoly feature of electric, gas, and communication utilities, however, he fails at times to give adequate recognition to the place of competition in promoting control over such businesses as milk and transport. These industries do not fit neatly into the generalization that "public utility enterprises represent the monopolistic segment of the economy where for reasons of public policy monopoly rights are accorded them" (p. 215). Missing in the background treatment is a careful analysis and comparison of the operating, cost, and service features of each of the transport agencies which bear on the current problems of competition, rate control, and coordination in the transport field.

The consideration of the administrative aspects of public utility regulation embraces accounting and financial policies, valuation, depreciation, rate of return, and the theory and practice of determining specific rates. In an informa-

tive and concisely written account of the administrative commission, the author finds that the main essential for success is adequate financial support and cautions against the exaggeration of the judicial function at the expense of investigational activities.

The significance of accounting principles and methods in the exercise of control is properly emphasized prior to a lengthy consideration of the rate-making function. All the facets of the valuation problem are dealt with comprehensively, including depreciation, with original cost favored over replacement cost as a standard for determining the base for the general level of rates. To assure a return on the actual investment adequate to attract and to hold capital in the face of a changing price level, a flexible rate of return is advocated. A careful explanation is made of the modern practice of fixing a differentiated rate of return based on the actual cost of debt capital and earnings-price ratios for the common equity. To what extent a variable rate of return thus calculated reflects a change in the purchasing power of money is not indicated. The author's suggestion that further study of the need for an inflation adjustment is well taken, for it is not at all apparent that the growth utilities have suffered under current regulatory practice in competing with other industries in the capital market.

Planning and coordination is the characterization given to the movement for public and cooperative ownership and the public projects for the development of regional resources. All of the regional projects are dealt with at length, perhaps with too much historical detail in the case of Los Angeles and the Colorado River. Particularly good are the chapters on the Tennessee Valley and the St. Lawrence projects. The projects are viewed as successful efforts to achieve maximum power development consistent with necessary flood protection and maximum benefits to navigation and land utilization. Power rates of the regional projects are not regarded as satisfactory yardsticks for measuring private utility rates, primarily owing to the marked inequality in tax burdens, but the promotional methods of the public agencies are seen to have had a salutary effect on private utility operations. Manifestations of the current "partnership policy" are not recognized as threats to the continued development of regional resources.

While this book provides an adequate, competent, and highly readable treatment of the economics and regulation of the electric, gas, and communication utilities, it does not live up to expectations with respect to transportation. Inadequate attention is given to rate policies and rate control, entry, consolidation, subsidy, and the whole problem of coordination in the transport industry. Except for a few pages devoted to the crisis in transport policies and the report of the Presidential Advisory Committee, transportation is treated only incidentally in the long section devoted to planning and coordination. Perhaps fuller consideration of transport problems would have created an inordinately large volume, but space could have been economized in the historical sections to produce a more useful book for the student of regulated industries.

MARTIN L. LINDAHL

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### **Land Economics; Agricultural Economics; Economic Geography; Housing**

*The World's Sugar—Progress and Policy.* By V. P. TIMOSHENKO and B. C. SWERLING. Stanford: Stanford University Press, 1957. Pp. xii, 364. \$6.50.

This is an excellent summary of the facts necessary for appraising national and international sugar policies, but a politico-economic analysis—also necessary for such an appraisal—is not provided. There is much to be said for presenting the story and leaving the reader to draw his own conclusions on future policy.

After a brief discussion in Part I of the demand and supply of sugar, Part II is devoted to the development of techniques in both cane and beet sugar production. Economists will be very grateful for such a clear outline of a sometimes complicated subject, but they will be less grateful for the isolated references to the works of Ricardo, Schumpeter and Galbraith, which do not really add anything to the technical discussion. The technical merits of sugar-beet production are striking; it supplies a cash crop and valuable by-products of cattle-feed; it has supported a depressed European agriculture and enabled more rational crop rotations to be introduced. On the other hand, the main technical advantage of cane sugar is its higher yield of sugar per unit of land.

However, the important economic question concerns costs, not technical merits. Cane and beet sugar are perfect substitutes, yet the former is cheaper. Nor is this cost differential likely to be eliminated by technical progress in beet sugar production; technical development in cane sugar has been equally impressive. If this is true, why is so much beet sugar produced? Why are not the underdeveloped cane-sugar countries flourishing with expanded crops, prosperous sugar-refineries, and all the other industrial development ancillary to sugar production?

Answers to these questions are in Part III, which describes the past policies of the United States, the United Kingdom (contributed by R. J. Hammond), Continental Europe and Russia. Each study maintains the very high standard set by Parts I and II, though the work remains descriptive rather than analytical. There is some justification for this in so far as political rather than economic factors have determined these policies. For political reasons, countries protect domestic refiners against imported refined sugar, protect domestic raw sugar production against imported raw sugar, and protect raw sugar imports from colonies and offshore possessions against imports from elsewhere. All the familiar arguments for protection have been used by the importing countries and it would be interesting to know whether the authors think they are valid.

The final chapter on the International Sugar Agreement of 1953 shows the absurdities which can arise when committees are substituted for free markets: high-cost production is encouraged at the expense of low-cost production; the leading importers favor high prices, and the leading exporting country favors low prices; in times of world excess supply the policies of the leading importing countries are designed to discourage consumption, while in times of excess demand they encourage consumption. Since this agreement does not deal with

the fundamental problems, the question of future policy is important. Could a completely free market, within a suitable legal framework to counteract any instability, solve them? Even if it could, is it practical politics? After reading the present book, I am inclined to answer, "Yes," to both questions. More important would be the answers of Timoshenko and Swerling. Of course, these questions raise a host of difficult problems, economic and political, but nobody is more qualified to answer them than are the authors of this book. Their unparalleled knowledge of the industry and their tactful description of existing policies lead us to hope that they will soon find time to write on future policy.

P. E. HART

*University of Glasgow*

*Land Tenure and Land Taxation in America.* By AARON M. SAKOLSKI. New York: Robert Schalkenbach Foundation, 1957. Pp. xii, 317. \$3.50.

If land economists have been remiss in assimilating the growing literature in their field, Dr. Sakolski\* would appear to have administered a needed corrective by undertaking a historical synthesis of our land tenure and land taxation systems. It might be said that he is concerned with America as a special case in the evolution of land institutions, for in introductory chapters he ranges over the nature of these institutions among primitive peoples and the civilizations of the ancient and medieval worlds. The broad theme running through the book is the change from a "collective concept, wherein absolute title to the soil was held by no individual or group . . . to a legal status, whereby individuals or groups, through political or economic power, were able to hold, use, transfer, and transmit its use and tenure for their own benefit or aggression, without any necessary regard for public welfare."

While in Europe this transition was slow and relatively peaceful, the New World was the scene of violent and unequal conflict between the property concepts of immigrant Europeans and those of the aborigines. Sakolski's book is largely about land disposal policies and practices from the period of early colonization to the present day, with Indian policy and land taxation and reform as minor themes. In three chapters he surveys the transfer to and subsequent modification of European—largely English—land tenure concepts in the thirteen colonies. A chapter on "Land and the American Revolution" is followed by five chapters on the period before the Homestead Act of 1862. In these chapters the author develops such topics as post-Revolutionary state-land disposal, the early history of the public domain, the Louisiana Territory, and the Preemption Act.

Historians who observe a marked contrast between colonial and early national land policies and practices may be surprised at the author's insistence upon continuity in the face of change. By focusing upon the institution of private property in land (alodial tenure in fee simple), he maintains that, though certain feudal practices of land-ownership and control had largely disappeared, an essentially aristocratic land system was perpetuated—a system

\* Dr. Sakolski met his untimely death in an automobile accident on December 29, 1955, while type for his book was being set.

comprising such features as absentee ownership, land engrossment, speculation, and wasteful utilization of natural resources. Even the Homestead and subsequent acts, though ameliorative in certain respects, failed to achieve a democratic land system, he believes. For the period since 1860 the author draws heavily upon the work of Paul W. Gates and other authorities in nine chapters which discuss such topics as the disposal of agricultural, forest and mineral lands; railroad land grants; farm tenancy; and the rise of urban real estate values.

Land taxation and land reform are inextricably linked in the last three chapters of the book. After summarizing the history of land taxation in Europe and America, the author comes to the central issue of his study, namely a consideration of possible land reform policies. Here he first looks to the past for possible guides to action. Beginning with the physiocrats in France, he discusses land reform movements in Europe and America. Much the greater part of the discussion concerns Henry George and his single-tax movement. Georgian economics is treated not only from a historical standpoint, but also as a possible means of reforming our present land system. While eschewing land nationalization, Dr. Sakolski comments favorably upon the following proposals: "(1) absorption of the economic rent of land and simultaneously untaxing improvements (i.e., primary buildings) on land as advocated so earnestly by Henry George as a matter of justice; (2) progressive taxes on land; (3) limitation of private landownership; and (4) social control of land use."

In many respects this book satisfies the need for a one-volume history of land tenure and land taxation in America, considered in the broad perspective of antecedent and contemporary theories and practices. It is written in an interesting and thought-provoking manner. Excellent use has been made not only of the writings of well-known scholars and statesmen, but also of lesser-known writers—both American and European. Though much of the subject matter will be familiar to land historians, what may not be so familiar is the conscious effort to view the problem from the standpoint of land reformers, and especially the theories of Henry George. While this approach has much to commend it, it may also have certain shortcomings. Among other things one reform movement may be emphasized to the virtual neglect of others. The reform of federal land policy since the closing of the land frontier—a subject singularly neglected in this study—would appear to be a case in point.

RICHARD B. SHERIDAN

*University of Kansas*

*The National Policy and the Wheat Economy.* By VERNON C. FOWKE.  
Toronto: Toronto University Press, 1957. Pp. x, 312. \$5.50.

This is the seventh volume in a series on the background and development of Social Credit in Alberta. Though Social Credit has held political power in the western wheat province for over twenty years, neither the party, its founders, nor its doctrines are given even a passing reference in this study of the wheat economy. This is probably not a coincidence, since Social Credit

played no part in the development of the wheat economy. Fowke leaves it to other authors in the series to show how national policy and the development of the wheat economy influenced the growth of the Social Credit movement in Alberta.

National policy, as defined by Fowke for the purposes of this study, "comprises collectively that group of policies and instruments which were designed to transform the British North American territories of the mid-nineteenth century into a political and economic unit" (p. 8). This book gives both a discussion of national policy as it related to the development of the wheat economy and an historical and analytical treatment of grain marketing problems in Western Canada.

The first third of the book, dealing with the origins and development of the national policy, is largely a restatement of the author's earlier work, *Canadian Agricultural Policy*. In this section he describes and evaluates the federal tariff, transportation, land, and immigration policies as they related to the development of the wheat economy. Fowke finds that, to be acceptable federally, policies had to serve to tie together commercially the central and western provinces. Alternative policies that did not promise to serve this end were rejected even though they promised more rapid development in a form more profitable to westerners.

In the second and third parts, comprising over one-half of the book, he discusses two stages of the history of grain marketing in Western Canada. The first stage involves the problems of technical and economic imperfections in the marketing structure; the second includes the long succession of steps involved in the farmer's fight to eliminate the open market. In the first stage Fowke detects two elements of national policy, one amenable to western pressure—"to encourage maximum economic development," and the other immutable—"to assure integration of western development into the national economy" (p. 93). The accounts of the controversies which arose in grain marketing include some of the best expositions in print of the economic imperfections in the developmental stage of the grain marketing system. In the struggle to remove these imperfections more effective competition was needed. Federal policy was amenable to producer demands in this regard.

After 1920, producer criticisms of the marketing system were directed at the open-market system and competitive pricing. Fowke has been quite successful in distilling, from the tidal wave of opposition to the open market, the essence of producer criticisms of that institution. He is less successful at finding justifications for specific criticisms. On this question he concludes that grower demands were "diametrically opposed to the free enterprise tenets underlying the national policy" (p. 191).

In Part IV, Fowke makes his major analytical contribution when he evaluates developments in national policy since 1930, by which date western development had been secured through policies initiated before 1900. He suggests that national policy in regard to grain marketing grew out of a philosophy of economic liberalism which accorded "equal tolerance to freedom of combination and freedom of competition," a policy which led to "disregard of the competitive inferiority of agriculture within the price system" (p. 290).

In an examination of federal agricultural legislation of the last quarter century he finds no clear indication that national policy has been modified in favor of the wheat economy. However, he limits his search to measures which affect the "competitive excesses of agriculture." The only two measures of this type, the Agricultural Prices Support Act and the Wheat Board Act, either served multiple purposes or were political necessities. In Fowke's opinion, the strongest evidence in support of the thesis that national agricultural policy has not changed permanently lies in "its lack of theoretical or conceptual content." Fowke provides a basis for a new policy that appears to capture the essence of western discontent—"a clear recognition of the competitive disabilities of agriculture within the price system" (p. 296). The adoption of this suggestion by a major political party could, in the opinion of this reviewer, be instrumental in effecting a change in national policy.

ARTHUR W. WOOD

*University of Manitoba*

*Die Futtergetreidewirtschaft der Welt 1900-1954.* By HANS-BRODER KROHN. Berichte über Landwirtschaft, N. S., Special Issue No. 165. Hamburg and Berlin: Paul Parey, 1957. Pp. 144. DM 12,50.

This publication presents the results of a detailed and constructive attempt to measure in quantitative terms the usually diverging trends in the demand for pork, beef, milk and eggs and in the production of these products and of grains and other nonroughage crops available for animal and poultry feeding. Statistics reflecting these trends are presented for (1) the United States, (2) Europe, Canada, Argentina and Australia (a somewhat illogical grouping of grain exporting and importing countries), and (3) all of these combined, for 1899-1913 and 1913-1928; for the United States and group (2) for 1929-1939; for the United States for 1927/29-1950/53 and 1937/41-1950/53; and for group (2) for 1934/38-1954. (Ranges for periods with multiyear beginnings and endings are those between the respective averages of the two terminal groups of years.)

The publication consists of four main parts. In the first, the author outlines general or basic considerations, including the determinants of the market prices of feed grains, hogs and pork; functions of price and income elasticity of demand for feed grains and pork; and the structural weaknesses of the feed-grains and animal-products economy—the "frictions" which hinder the price mechanism in closing the gap between the diverging trends, such as the inelasticity of the supply of agricultural products, particularly during periods of declining prices.

In Part II the influences responsible for increasing production of feed grains and edible animal products are explained. Krohn insists that by far the most important cause of the long-term increases in output of agricultural products have been developments in production techniques and efficiency. He believes that the influence of economic forces, such as prices, in this regard has been very limited, but he admits that farmers will not adopt improved production techniques unless the price relationships between their costs and incomes are such as to enable them to operate in the black.

Part III names factors which in the long run cause shifts in the demand curve for all foods in general and in that for edible animal products in particular. It includes a table listing annual percentage rates of increase in the demand for pork in (1) the United States, (2) Europe, Canada, Argentina and Australia and (3) all of these areas for 1899-1913 and 1913-1929, for (1) and (2) for 1929-1939 and 1939-1954, and for only the United States for 1928-1954. These rates were estimated upon the basis of the respective percentage rates of increase in population and per capita real income, and the respective coefficients of income elasticity of demand, assuming proportional increases in supplies of pork and constant retail prices. Part III also has pertinent data on price elasticity of demand, with a discussion of the usefulness and the basic determinants of price elasticity data.

Part IV points out that in the period 1899-1913, owing primarily to a relatively slow rate of technical development, production of both feed grains and the edible animal products derived from them generally did not keep pace with the increase in demand for animal products in the areas under consideration. The increase in demand was due mainly to unusual increases in population in the United States and in per capita real income in Europe. In the period from 1913-1929, a general slowing down of economic development, particularly in the rate of increase in per capita real income, and various other influences, left the demand for animal products and the suppliers of feed grains and of animal products generally in equilibrium in these areas.

Part IV describes 1929-1939 as a period during which there was a tendency toward overproduction in feed grains, and at the end of the period surpluses had accumulated in the United States and Canada. The situation during this period in regard to incomes and population generally was such that demand for animal products increased very little, and if there had not been a number of extensive crop failures in North and South America, much larger surpluses of feed grains would have accumulated. In the United States, reductions in corn acreage by Agricultural Adjustment Administration were offset by increases in corn yields and in production of feed grains not under A.A.A. control (barley, oats and soy beans).

Krohn found that for the period 1927/29-1950/53, data in satisfactory form were available only for the United States and for this period his investigation is confined largely to this country. He states that this period is one during which the average annual rates of increase in production of animal products did not keep pace with rates of increase in feed production and in the demand for animal products. Among circumstances to which this is attributed are a significant reduction in the number of pigs on farms after the unusually low corn harvest of 1947 which was followed by a good harvest in 1948, and, most important of all, the support of the producer prices of corn above the market levels after the 1948 harvest had produced a large surplus and market prices had fallen.

In this reviewer's opinion, Krohn's brief discussions of or references to the details and effects of the programs which many countries, including his own, have in operation directly or indirectly to control producer prices and domestic production, limit imports or stimulate exports of feed grains, and the

reasons those countries have for operating those programs are too limited. Those programs certainly have done much to control the levels of production and consumption of feed grains, livestock and livestock products in these countries. With the exception of this major deficiency, this treatise is in general a very creditable job. It is amply "quantified" throughout, and includes a number of interesting charts. It shows that the author is closely familiar with the feeds and animal-products economy and is widely read in the econometrics literature of his own and other countries.

CARL F. WEHRWEIN

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*Toward Responsible Government: An Economic Appraisal of Federal Investment in Water Resource Programs.* By EDWARD F. RENSHAW. Chicago: Idyia Press, 1957. Pp. xii, 164. \$2.50.

Federal water resource programs, which reflect complex political, social, and economic forces, are generally initiated and vigorously supported by sectional interests on the ground of improving the national well-being. Possibly because the economic justification for such undertakings is sometimes questionable, the federal agencies most active in river basin development—such as the Army Corps of Engineers, the Bureau of Reclamation, and the Department of Agriculture—have developed a type of project economic evaluation ("cost-benefit" analysis) that purports to simulate the allocating mechanism of the private economy in deciding among alternative investment opportunities. Whether the cost-benefit ratio—the final summary form of the agency analysis—was originally intended to confer the sanction of the private market upon public investment is not clear, but there is increasing evidence that agency studies do not lead to decisions that are comparable with those of the private market.

In reviewing the procedures of the Bureau of Reclamation, the Army Corps, and the Department of Agriculture for evaluating benefits and costs of selected projects, Renshaw concludes that in virtually every case these analyses have been biased in favor of public investment by a dual overstatement of project benefits and an understatement of project costs. Renshaw finds public investment in water resource programs generally carried well beyond the point where the federal undertaking achieves a return equivalent to investment in the private economy, and indeed beyond the point of a significant contribution to national output. Reclamation projects, for example, neither use resources efficiently nor add importantly to agricultural output, whereas the Army Corps is found guilty of gross exaggeration of benefits in justifying flood control projects and navigation improvements. The Soil Conservation Service, in evaluating the worth of watershed protection, subscribes to overvaluation of capital use in agriculture.

The remedy for the misallocation of resources that results from public overinvestment in water resource projects is, according to Renshaw, (1) in general to impose more rigorous standards upon federal agencies seeking Congressional appropriations and (2) in particular to strip the self-interested agency of

authority to make cost-benefit studies that influence Congressional decisions on appropriations. The establishment of an independent appraisal board is also suggested as one means of increasing the validity of project economic evaluation in some cases.

*Toward Responsible Government* is an impassioned criticism of federal water investment policies. An unquestioning and almost reverent acceptance of the private market standard as a basis for appraising the worth of public investment, however, leads at times to oversimplification or avoidance of important features of the water resources problem.

LAWRENCE G. HINES

*Dartmouth College*

*Residential Finance, 1950.* By RICHARD U. RATCLIFF, DANIEL B. RATHBUN, and JUNIA H. HONNOLD. A Census-Social Science Research Council Monograph. New York: John Wiley; London: Chapman & Hall, 1957. Pp. x, 180. \$6.00.

Some time ago the Social Science Research Council in cooperation with the Bureau of the Census commissioned the preparation of a series of Census Monographs. This study—Volume VII in the series—deals with the financing of residential real estate.

Persons primarily interested in the last Census will find this volume a useful work of reference. In 192 tables, spread over an almost equal number of pages, it summarizes the important Census findings on the financing of all types of homes. There are cross-classifications for nearly every conceivable characteristic of mortgage borrower and lender—by type of mortgage, type of lender, and type of geographic location. And every page has descriptive text to explain the findings of the tables.

But there is not the analysis in depth, the isolation of important variables, and the boldness and insight which distinguish an exciting exploration. The authors have done a competent statistical job, but their study does not meet the broad objectives of this series. As stated in the foreword to the book, the purpose of these monographs is to analyze not merely the results of the 1950 Census, but to "include broad exploration of new questions suggested by the new information, as well as the narrowing of doubt and controversy."

The main shortcoming of this volume—its lack of concern with raising new questions and challenging hypotheses—was the inevitable result of the way the authors conceived of their assignment. In the introduction, they disclaim any attempt to single out important relationships which might illuminate the financial practices of borrowers and lenders. They admit that "detailed examination of a limited number of arbitrarily selected hypotheses would lend analytical elegance to our work and avoid the tiresome recitation of fact inherent in extensive treatment." At the same time, they insist that "such an approach would run the risk of ignoring more important material." The authors are not inclined to take this risk.

The reader whose interest centers in long-term trends and relationships will also miss comparison with earlier statistics. Except in a few places, the authors

are reluctant to introduce earlier census and noncensus statistics for fear of "straining" the data unduly. While there are, no doubt, many statistical and conceptual difficulties in reconciling previously collected data on residential financing with the latest Census results, the development of some historical perspective is indispensable to a study designed to be analytical, not merely descriptive.

The authors include no data on the changing pattern of home financing since 1950. Thus, persons engaged in current research on housing problems are likely to find this volume of only limited usefulness.

The Social Science Research Council is to be commended for underwriting extensive research on the 1950 Census. But if the results are to be worth the effort, the authors must be encouraged to work with observations over a period of time, to extricate strategic factors from the mass of data, and boldly to suggest hypotheses to explain observed trends and relationships.

WILLIAM C. FREUND

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### Labor Economics

*Printers and Technology; A History of the International Printing Pressmen and Assistants' Union.* By ELIZABETH FAULKNER BAKER. New York: Columbia University Press, 1957. Pp. x, 545. \$7.00.

Mrs. Baker's book carries us back to the heroic age of American unionism, and then brings us down again to the troublesome technological and jurisdictional problems of the present. It may be regarded as an extension and amplification of her earlier study, *The Displacement of Men by Machines*, which also related to the Pressmen and which was much consulted during the great depression. Being based very largely upon the files of *The American Pressman* and the proceedings of union conventions, and giving a fair and commendatory account of the policies and activities of the Pressmen's Union, it should go very far to fulfill the long-cherished hope of George Berry and other officers of that body for an authentic and continuous history which might be placed in the hands of apprentices and others in need of a proper background or indoctrination. Perhaps the style and method of presentation may be a trifle academic and literary for that group; but particularly for the period of Berry's presidency from 1907 to 1948, the record is often quite dramatic and enlivened by interesting personalities and quotations from debates, letters and articles. If the general reader or student of labor problems finds the treatment somewhat too detailed in places, he should reflect that the history of such an old and important organization offers, in epitome, an understanding of the whole labor movement.

Some mild quibbling might be indulged in as to the use of the word "printers" in the author's title, but only for the purpose of emphasizing the complexity of the industry and of the relationships among different crafts. In the earlier period when workmen, especially in the smaller shops, often performed more than one operation, when all or almost all were members of the

Typographical Union and dominated by the typesetters or compositors as the most numerous contingent, the general public seems to have lumped them all together under the term "printers." But with the rise of larger plants, increased division of labor, and technological progress, there was more differentiation and more dissatisfaction among the minority groups, until in 1889 the pressmen broke away and formed an autonomous union, to be followed by the bookbinders, photoengravers, and other trades. At several points in the history there are references to the relative skill required in the different branches, as to whether the average pressman could be considered a "practical printer," and a bit later as to whether in highly mechanized work like that of the web-pressman any real skill and intelligence is needed. To all this the pressmen are cited as making reply, that with so much equipment in their charge they have the greatest responsibility, and that they are the actual printers because they alone bring the type in contact with the paper and make the final product. None the less, the term as applied to the pressmen alone seems too inclusive.

More strictly on the technology side, which is the author's main concern throughout, she leaves no doubt but that the Pressmen have been subjected to a greater amount of change than the lordly compositors who were fairly immune until the coming of the linotype in 1890 and following. There was the growing use of power-presses after 1830, the revolutionary web-press in the 1890's, mechanical press-feeders after 1900, and more recently the great development of offset printing, and the breakup of the trade into specialties. Fortunately, except during periods of depression, the industry was growing rapidly and could generally take up the slack over limited periods. Along with the elasticity of demand, mention might have been made here of the concomitant improvements that were being made in the paper industry. The amount of capital involved and union-management cooperation helped to insure that changes be made more gradually. If skill was still necessary, it was of a type which implied adaptability and versatility—hence the wisdom of the Technical Trade School started in 1913 for the training and retraining of apprentices and foremen. Overcoming craft pride and rivalry, and adaptation of union structure to the altered conditions, have proved much more difficult. Berry favored federation of all the printing trades and joint bargaining. The Pressmen have given representation to the growing number of specialists. But amalgamation and industrial unionism do not seem to be making rapid progress even since the uniting of the A.F. of L. and the C.I.O.

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### **Population; Welfare Programs; Standards of Living**

*Population Theories and the Economic Interpretation.* By SYDNEY H. COONTZ.  
New York: The Humanities Press, 1957. Pp. 200. \$5.00.

The purpose of S. H. Coontz's book—a doctoral dissertation written with D. V. Glass at the London School of Economics—is to put the analysis of population growth under the law of supply and demand, and thus to return population theory to its natural habitat, the field of economics. In addition

to its theoretical contribution the book is an exercise in polemics against those theorists who do not agree with this view. Population is seen as a dependent variable in that "both long-run and short-run changes in fertility are a function of changes in the demand for labor" (p. 195). The fundamental "determinant of fertility patterns is demand for labor and not democratization of the knowledge of efficient means of contraception."

The work thus represents a theoretical gloss on one of the less inspired dicta in Adam Smith's *Wealth of Nations* (Cannan edition, New York 1937, p. 80): namely, "that the demand for men, like that for any other commodity, necessarily regulates the production of men . . . and determines the state of propagation in all of the different countries of the world."

To establish this interpretation, the author makes quick dispatch of biological theories represented among others, by Raymond Pearl, J. de Castro, and Herbert Spencer, and of cultural theories represented, for example, by A. Dumont and Frank Fetter. Malthus, he holds, equates the demand for labor with the means of subsistence, thus drawing conclusions much more pessimistic than justified by analysis of the demand factor. Coontz finds some support for his position among classical economists, little among the neoclassical school and most of all among the Marxists, partly because the Marxists dispute the Malthusian position. Of the great theorists, Coontz cites Alfred Marshall as best supporting his position.

The author does not contend that economists have done the analysis necessary to establish labor demand as the force back of the birth rate. But from the work they have done and left undone, the author formulates his own interpretation. It is best seen in Chapters 6 and 8 and may be summarized as follows: Ideally a theory of population should explain both historic changes in fertility and class differences and provide the basis for predicting future fertility patterns, given the stage of economic development and the type of social organization (p. 13). This can be done in a demand-for-labor analysis. Increases in aggregate demand will increase births. Decreases in total demand or increases in demand for higher quality labor (cost factor) will decrease births. Differential fertility is due to the differences between raising more expensive and less expensive units of labor for the market. The Industrial Revolution furnished the great population increase of transitional growth (1) by increasing the aggregate demand for labor and (2) by lowering the quality demanded (women and children wanted in mines and factories). In capitalist countries a tendency exists for wages to equal the cost of production of labor power.

In the demand-for-labor analysis, a vast immigration substitutes for fertility, and in the United States fertility has thus fallen in spite of economic progress because the demand for aggregate labor supply was met by immigration and the demand for increased quality (which raises cost) lowered the birth rate of the native population. Decline in mortality also substitutes for increased fertility in meeting labor demand. Continued fertility decline, however, is a function of the slowing down of the rate of economic progress and we are left with the thought that the failure of recent population projections was due

to the fact that they involved a passive assumption of continued decline in the rate of economic expansion.

Coontz, it seems to me, is in position to make a specific prediction as to employment rates eighteen to twenty years hence. Given the rising birth rate as a response to long-run labor demands, we should expect high rates of employment in 1979-1990. The author does not make this prediction, but it is to his credit that he strives with the problem of short-run and long-run analysis and—unlike Joseph S. Davis after decrying the misguided population projectionists—he manfully strives to show where they failed in not expecting an increased demand for labor. This is anything but an agnostic position, and I for one admire him for taking it. One of Coontz's greatest regrets is that notable economists like J. M. Keynes, Paul Sweezy, A. H. Hansen and George Terborgh have been led down the garden path by following the projections of W. S. Thompson and P. K. Whelpton. If they had analyzed the demand for labor rather than giving way to raw empiricism, they, it is thought, could have avoided these fallacies.

On the other hand it must be said that the support for this heavy theoretical apparatus is slight indeed. There is very little empirical analysis in the book; not a single demand and supply curve is given in evidence to show the effect of labor demand on birth rates. It is interesting to compare this theoretical approach from economics with the empirical approach from demography that Whelpton used in his *Cohort Fertility* (Princeton 1954) in which he found births postponed, made up, and anticipated in line with the schedule of depression and prosperity. An analysis of this data would, it seems to me, offer some of the empirical support which Coontz's position so greatly needs.

What is the conclusion of the whole matter? First, one can say that in the unsure and ambiguous theoretical footing on which demography now stands, we are allowed to be grateful for a work which dares to take a stand and be controversial in so doing. But is the position well taken? Is it established by the analysis? To these questions the reviewer, if he is honest with himself, must reply with the verdict that J. D. Bury once rendered on *The Idea of Progress* (1921). "It is true or it is false," he wrote, "and [like the doctrine of Providence or personal immortality] cannot be proved true or false. Belief in it is an act of faith." Coontz has that faith.

In passing it can be pointed out that some of Coontz's statements will bear citation in refutation of his general point of view. Thus he writes: "A demand-for-labor analysis is required for a further understanding of family limitations among the poor—why among the propertyless masses, the group least able to afford children, make a relatively greater contribution" (p. 100). In a footnote elsewhere he states: "It should be obvious that the economic interpretation . . . does not assume an existing economic motive for procreation" (p. 152).

Economic determinism, under which the labor-demand theory falls, is, it seems to me, a special case of psychological theory in which man's actions are seen as rational with his responses especially sensitive to one class of stimuli—the economic. The trouble with transferring the profit-and-loss calculus of

supply and demand to population growth—"the production of men in response to the demand for men"—is that another kind of hedonistic calculus is involved, that is, the affectional-sexual relations of the human species. It would take Freud and Marx together to resolve this calculus and that is precisely the advance that Malthus made over Adam Smith. In teaching population courses, demographers have looked for ideological opponents on whom they might exercise their proclivities for polemics. In writing this book Coontz has, I believe, furnished this object. If so, shall we sit back and watch the straw fly?

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## TITLES OF NEW BOOKS

### General Economics; Methodology

DAVIDSON, R. K., SMITH, V. L., AND WILEY, J. W. Economics—an analytical approach. Homewood, Ill.: Irwin, 1958. Pp. xviii, 393. \$7.

GALBRAITH, J. K. The affluent society. Boston: Houghton Mifflin, 1958. Pp. xii, 368. \$4.75.

GRAYSON, H. AND LOHMAN, P. H. Principles of economics. New York: Am. Book, 1958. Pp. xxxii, 720. \$7.

GROSSMAN, M. C., HANSEN, R. R., HENDRIKSEN, E. S., AND OTHERS, ed. Readings in current economics. Homewood, Ill.: Irwin, 1958. Pp. xii, 452. \$3.95.

MARKOVIČ, L. Osnovi političke ekonomije. (Principles of political economy.) Sarajevo, Yugoslavia: Narodna Prosvjeta, 1957. Pp. 208.

METAXAS, B. N. Introduction to mathematical economic analysis. (In Greek.) Athens: Author, 1955. Pp. 217.

MONSAROFF, B. Economics, science, and production—science as a politico-economic factor of production. New York: Vantage Press, 1958. Pp. 196. \$3.

"It is about time that scientists should point out the fallacy of existing economic theories, and thus help economists to formulate a new theory which corresponds more closely to actual contemporary conditions.

"The present work has in view a two-fold purpose: first, to acquaint scientists with some economic theories; second, to draw the attention of the economists to their fallacy of disregarding science. It will also point out ways in which modern economic concepts might be altered or modified in the light of scientific development." (From the introduction.)

RASMUSSEN, J. J., ed. Proceedings of the Thirty-Second Annual Conference of the Western Economic Association at Salt Lake City, Utah, August 28-30, 1957. Salt Lake: West. Econ Assoc., Univ. Utah, 1958. Pp. 94.

SAMUELSON, P. A. Economics—an introductory analysis. 4th ed. New York: McGraw-Hill, 1958. Pp. xx, 810. \$6.75.

SAMUELSON, P. A., BISHOP, R. L., AND COLEMAN, J. R., ed. Readings in economics. 3rd ed. New York: McGraw-Hill, 1958. Pp. xi, 474. \$3.25.

STIGLER, G. J. The goals of economic policy. Henry Simons Lectures, no. 1. Chicago: Univ. Chicago Law School, 1958. Pp. 15. 75¢.

VINER, J. The long view and the short—studies in economic theory and policy. Glencoe, Ill.: Free Press, 1958. Pp. 462. \$6.

WAFFENSCHMIDT, W. G. Wirtschaftsmechanik. Stuttgart: Kohlhammer, 1957. Pp. vii, 301. DM 23.00.

An application of the principles of theoretical mechanics to several areas of economic analysis.

Selected list of unclassified research memoranda of the economics division of the RAND Corporation. USAF Project RAND. RM-821-5. Rev. Santa Monica: RAND, 1957. Pp. 16.

### Price and Allocation Theory; Income and Employment Theory; Related Empirical Studies; History of Economic Thought

ARROW, K. J., KARLIN, S. AND SCARF, H. Studies in the mathematical theory of inventory and production. Stanford: Stanford Univ. Press, 1958. Pp. ix, 340. \$8.75.

Other authors contributing to the volume are M. J. Beckmann, J. Gessford, R. F. Muth.

BLAUG, M. Ricardian economics—a historical study. Yale stud. in econ., no. 8. New Haven: Yale Univ. Press, 1958. Pp. x, 269. \$5.

- BOWMAN, M. J., ed. Expectations, uncertainty, and business behavior. A conference held at Carnegie Institute of Technology, October 27-29, 1955, under the auspices of the Committee on Business Enterprise Research. New York: Soc. Sci. Research Council, 1958. Pp. vii, 202. \$2.
- DARČEVIĆ-KUČAR, S. John Maynard Keynes—Teoretičar državnog kapitalizma. (J. M. Keynes—a theoretician of state capitalism.) Zagreb, Yugoslavia: Kultura, 1957. Pp. 257.
- DUSENBERRY, J. S. Business cycles and economic growth. New York: McGraw-Hill, 1958. Pp. xi, 341. \$6.50.
- GÄRLUND, T. The life of Knut Wicksell, Stockholm econ. stud., n.s. 2. Transl. by N. Adler. Stockholm: Almqvist & Wiksell, 1958. Pp. 354. Skr. 30.  
A review of the Swedish edition appeared in the December 1957 *American Economic Review*.
- ISCHBOLDIN, B. Economic synthesis. New Delhi: New Book Soc. of India, 1958. Pp. 543. Rs 30.; £ 2.; \$6.
- KOYCK, L. M., HENNIPMAN, P. AND WILLINGE PRINS, C. W. Verbruik en sparen in theorie en praktijk. (Consumption and savings in theory and practice.) Haarlem: Tjeenk Willink, 1957. Pp. xi, 409. f 22.50.
- REUEL, A. Russkaya ekonomicheskaya mysl' 60-70-kh godov XIX veka i marxism. (Russian economic thought of 1860-1870's and Marxism.) Moscow: Gospolitizdat, 1956. Pp. 424.
- SAMARDŽIJA, M. Cena proizvodnje—metodološko-teorijska razmatranja. (The output price—a methodological and theoretical study.) Belgrad: Nolit, 1957. Pp. 205.
- SCHOUTEN, D. B. J. Exacte economie. (Exact economics.) Leiden: Stenfert Kroese, 1957. Pp. 28. f 18.
- WILHITE, V. G. Founders of American economic thought and policy. New York: Bookman Assoc., 1958. Pp. 442. \$6.
- First report [of the] Council on Prices, Productivity and Incomes. London: H. M. Stat. Off., 1958. Pp. iv, 75. 2s.
- Narysy z istroyi ekonomichnoyi dumky na Ukrayini. (Outline of history of economic thought in the Ukraine.) Kiev: Acad. Sci. Ukrainian SSR, 1956. Pp. 387.

### Economic History; Economic Development; National Economies

- ALLEN, G. C. Japan's economic recovery. New York: Oxford Univ. Press, for Royal Inst. Internat. Affairs, 1958. Pp. xi, 215. \$4.75.
- BHATTACHARYYA, D. India's five year plans—an economic analysis. Rev. ed. Calcutta: Udayan Granthagar, 1957. Pp. 119. Rs 3.50; 7s 6d.
- CARROTHERS, G. A. P. AND ALONSO, W. Papers and proceedings of the Regional Science Association, 1957. Vol. 3. Philadelphia: W. Isard, Wharton School, Univ. Penn., 1957. Pp. 332.  
The papers included are listed under the following main headings: Potential Contributions of Regional Science; Theories in Regional Science; Empirical Analysis: I, Money Flows; II, Transportation; III, Underdeveloped Areas; Case Studies.
- CITRON, Z. AND KESSLER, A. Investments in manufacturing made through the Investment Center. Jerusalem: Falk Proj. for Econ. Research in Israel, 1958. Pp. iv, 69. If 1.  
This paper summarizes the results of a study of some of the effects of investments in manufacturing firms which were approved by the Government Investment Center (Israel) during the period 1948-54.
- DALMULDER, J. J. J. De economische problematiek van Algerije. (The economic problems of Algeria.) Leiden: Stenfert Kroese, 1957. Pp. 43. f 3.50.
- FFORDE, J. S. An international trade in managerial skills. Oxford: Basil Blackwell, 1957. Pp. viii, 153. 18s 6d.  
In its original form this book was a report for the International Bank for Reconstruc-

tion and Development. The problem considered is: In cases in which underdeveloped countries are in need of foreign managerial and technical services, in connection with local promotion of industrial enterprises as part of their developmental programs, what are the best procedures for providing these services? The problem is examined, and various criteria for providing answers to it, in the particular context of the relations between the United Kingdom and underdeveloped countries.

FIRESTONE, O. J. Canada's economic development 1867-1953—with special reference to changes in the country's national product and national wealth. Income & wealth ser. 7. (London: Bowes & Bowes, 1958. Pp. xxvi, 384. 45s.

HALD, M. W. A selected bibliography on economic development and foreign aid. USAF project RAND. RM-2096. Santa Monica: RAND, 1957. Pp. 100.

HANCE, W. A. African economic development. New York: Harper, for Council on For. Rel., 1958. Pp. x, 307. \$4.95.

HOLUBNYCHY, V. The industrial output of the Ukraine 1913-1956—a statistical analysis. Munich: Inst. for Study of USSR, 1957. Pp. ix, 63.

KHÔ, L. T. L'économie de l'Asie du Sud-Est. "Que Sais-Je?" no. 769. Paris: Presses Univ. de France, 1958. Pp. 128.

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MICHELL, H. The economics of ancient Greece. 2nd ed. New York: Barnes and Noble, 1957. Pp. 427, \$8.50.

NASH, M. Machine age Maya—the industrialization of a Guatemalan community. Glencoe, Ill.: Free Press; Chicago: Research Center in Econ. Develop. and Cult. Change, Univ. of Chicago, 1958. Pp. vi, 118. \$5.

ROSTOVITZ, M. The social and economic history of the Roman Empire. 2 vols. 2nd ed. rev. by P. M. Fraser. Fair Lawn, N. J.: Oxford Univ. Press, 1957. Pp. 890. \$26.90.

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TAYLOR, W. C. The Firestone operations in Liberia. U.S. bus. performance abroad, case stud. no. 5. Washington: Nat. Planning Assoc., 1956. Pp. xii, 115. \$1.

TINBERGEN, J. The design of development. Baltimore: Johns Hopkins, 1958. Pp. viii, 99. \$2.50.

This is the second publication of the Economic Development Institute. The Institute was established by the International Bank for Reconstruction and Development. Publications of the Institute "are primarily designed for use by persons working in responsible administrative and advisory capacities in government, financial institutions or other important sectors of the economy of the Bank's less developed countries." The present study is designed to serve as a basis for discussions of development policies and problems of programming and project appraisal.

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WOLMAN, W. The development of manufacturing industry in the State of Washington. Econ. and bus. stud. no. 31. Pullman: Bur. Econ. and Bus. Research, State Col. Wash., 1958. Pp. 208. \$4.

"This study has three related purposes: (1) to present, as completely and accurately as

possible, the historical record of the Washington manufacturing economy; (2) to analyze this record in terms of a 'model' of regional economic growth; and (3) to apply what could be learned about the past of the Washington manufacturing economy to obtaining some insight into its future." (From the preface.)

WOODRUFF, W. AND MCGREGOR, L. The Suez Canal and the Australian economy. Melbourne: Melbourne Univ. Press; New York: Cambridge Univ. Press, 1957. Pp. 20. 2s 6d; 75¢.

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Economic survey of Asia and the Far East—1957. UN pub. no. 58.IIF.1. New York: Columbia Univ. Press, 1958. Pp. x, 261. \$2.50; 10.50 sw.fr.

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### Statistical Methods; Econometrics; Social Accounting

DEANE, P., ed. Bibliography on income and wealth. Vol. VI, 1953-1954. London: Bowes & Bowes, for Internat. Assoc. for Research in Income and Wealth, 1958. Pp. 139. 37s 6d.

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"Some facility with standard algebraic techniques and an acquaintance with the essentials of trigonometry, together with at least a modicum of that elusive quality known as mathematical maturity, should be adequate preparation for reading this book." The book is primarily intended for social scientists, especially economists, psychologists and sociologists.

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Statistical yearbook 1957. 9th issue. Prepared by the Stat. Off., UN Dept. Econ. Soc. Affairs. Pub. no. 1957-XVII-1. New York: Columbia Univ. Press, 1958. Pp. 674. \$8.; paper, \$6.50.

### Economic Systems; Planning and Reform; Cooperation

BIRMAN, A. M. Finansy otrasley narodnogo khozyaystva SSSR. (Finance of sectors of the economy of the USSR.) Vol. 1 and 2. Moscow: Gosfinizdat, 1953; 1957. Pp. 236; 320.

BUNICH, P. Amortizatsiya osnovnykh fondov v promyshlennosti. (Depreciation of fixed capital in industry.) Moscow: Gosfinizdat, 1957. Pp. 157.

- COLE, G. D. H. Capitalism in the modern world. Fabian tract 310. London: Fabian Soc., 1957. Pp. 33. 2s 6d.
- KNOX, F. The Co-Operative Movement and monopoly in Great Britain. Co-op. college papers no. 4. Loughborough: Ed. Dept., Co-op. Union, 1957. Pp. 72. 1s.
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### Business Fluctuations

- COPLAND, D. B. AND BARBACK, R. H., ed. The conflict of expansion and stability. Documents relating to Australian economic policy, 1945-1952. Melbourne: Cheshire; New York: Inst. Pacific Rel., distrib., 1957. Pp. xvii, 795. 7s 6d.; \$9.
- MEADE, J. E. The control of inflation. Cambridge: Cambridge Univ. Press, 1958. Pp. 52. \$1.  
An inaugural lecture delivered in Cambridge, March 4, 1958.
- THOMASSEN, H. Business planning for economic stability. Washington: Pub. Affairs Press, 1958. Pp. iv, 60.  
By "business planning" is meant "planning consciously undertaken by the existing independent business units of American society for the expressed purpose of moderating business fluctuations." The chances of such planning being effectively undertaken are increased, according to the author, if automation "forces a long-range non-cyclical outlook upon participating units," and if increasing concentration of business occurs. Government can aid by "moral suasion," by "easing business concentration," and by disseminating economic information.
- Anti-recession policy for 1958. A statement by the CED program committee. New York: Com. for Econ. Develop., 1958. Pp. 30.
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### Money, Credit and Banking; Monetary Policy; Consumer Finance; Mortgage Credit

- BEYER, G. H., assisted by MANGIAMELE, J. Cornell home buying study—annual report 1957. Ithaca: New York State Coop. Extension Serv., 1958. Pp. 27.
- PICK, F. The United States dollar—requiem for a dead half. New York: Pick Pub., 1958. Pp. 26.
- PRITCHARD, L. J. Money and banking. Boston: Houghton Mifflin; Cambridge: Riverside Press, 1958. Pp. xiv, 783. \$6.95.
- V. SPINDLER, J., BECKER, W. AND STARKE, O. E. Die Deutsche Bundesbank—Grundzüge des Notenbankwesens und Kommentar zum Gesetz über die Deutsche Bundesbank. Stuttgart: W. Kohlhammer, 1957. Pp. xv, 270.
- ZOLOTAS, X. Monetary stability and economic development. Athens: Bank of Greece, 1958. Pp. 33.
- Annual report of the Federal Deposit Insurance Corporation for the year ended December 31, 1957. Pt. 1—Operations of the Corporation. Washington: Fed. Dep. Ins. Corp., 1958. Pp. ix, 22.
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- Federal Reserve monetary policies. Hearing before a subcommittee of the Senate Committee on Banking and Currency, 85th Cong., 2nd sess., February 19, 1958. Washington: Supt. Docs., 1958. Pp. 40.
- Financial Institutions Act of 1957. Hearings before the House Committee on Banking and Currency, 85th Cong., 2nd sess., January 14-February 7, 1958. Pt. 2. Washington: Supt. Docs., 1958. Pp. 950.

## Public Finance; Fiscal Policy

BINDER, R. Die Erfahrungen mit dem Splitting in den Vereinigten Staaten von Amerika. Kiel: Inst. f. Weltwirtschaft, Univ. Kiel, 1958. Pp. 44. DM 4.-.

BUCHANAN, J. M. Public principles of public debt—a defense and restatement. Homewood, Ill.: Irwin, 1958. Pp. xi, 223. \$5.

COWAN, H. B. Municipal improvement and finance—as affected by the untaxing of improvements and the taxation of improvements and the taxation of land values. New York: Harper, distrib. for Internat. Research Com. on Real Estate Tax., Pp. 50. \$3.

DAVIES, R. W. The development of the Soviet budgetary system. New York: Cambridge Univ. Press, 1958. Pp. xxi, 327. \$8.50.

HOLZMAN, R. S. Arm's length transactions. New York: Ronald Press, 1958. Pp. ix, 169. \$10.

This is an examination of the working of Section 482 of the Internal Revenue Code. The provision is concerned with the situation in which two or more enterprises are subject to unitary control. "If the management of a controlled group of enterprises, through design or through ineptitude, fails to allow to each member of the group a fair profit, *some* member will not pay a large enough tax; and that is the government's concern. The common control may not be used to reduce, to avoid, or to escape taxes." (From the introductory chapter.)

— The tax on accumulated earnings. New York: Ronald Press, 1958. Pp. vii, 136. \$10.

"This book was designed to show corporate executives, and their advisers, the tax consequences of accumulated earnings. Thorough analysis is made of the problem and of how to cope with it. This work is an extremely practical one: it is not concerned with what the law was or what it should be." (From the preface.)

LENT, G. E. A tax program for small business—how should small corporations be taxed? Hanover: Amos Tuck School, Dartmouth College, 1958. Pp. 28.

This article is the twentieth in a series on business and economic subjects published by the Amos Tuck School. Free copies may be had by writing the author at the school.

MATTHEWS, G. T. The Royal General Farms in eighteenth-century France. New York: Columbia Univ. Press, 1958. Pp. xii, 318. \$5.50.

"This study is an examination of an old-regime French tax-collecting agency, the General Farms, and of that agency's leadership, the Company of General Farmers. It seeks to describe the taxes collected by the General Farms and to analyze the organization's bureaucratic structure and procedures. . . . It is a study in fiscal administration; it is also a study in the financial history of the late Bourbon monarchy in France." (From the preface.)

POSNER, S. I. AND ALLAN, H. J. What the businessman should know about: federal taxes and foreign investments. Washington: Pub. Affairs Press, 1958. Pp. 14. 50¢.

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"The purpose of this study is to describe and analyze the effects of using rapid amortization under present legislative authorization. Major attention is centered on the administrative application of the device." (From the preface.) Attention is given to the weaknesses, as well as to the elements of strength, of the incentive effect of the device; also, to certain procedural difficulties. However the author concludes that continued use of accelerated amortization seems desirable.

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Technical Amendments Act of 1958. Hearings before the Senate Committee on Finance, 85th Cong., 2nd sess., February 25-28, 1958. Washington: Supt. Docs., 1958. Pp. 448.

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# NOTES

## SEVENTY-FIRST ANNUAL MEETING OF THE AMERICAN ECONOMIC ASSOCIATION

Palmer House, Chicago, Illinois, December 27-29, 1958

### *Preliminary Announcement of the Program, July 15, 1958*

The central theme about which most of the papers are organized is "The United States Economy in a World of Competitive Co-existence." The development of this theme includes papers analyzing the prospects and problems of the communistic economies, the problems facing underdeveloped countries and the American policy towards them, and the problem of maintaining a strong and stable American economy without sacrificing the free enterprise system.

*Friday, December 26, 1958*

6:30 P.M. Executive Committee Dinner Meeting

*Saturday, December 27, 1958*

9:30 A.M. SOVIET ECONOMIC TRENDS AND PROSPECTS

*Chairman:* ABRAM BERGSON, Harvard University

*Papers:* Industrial Growth

FRANCIS SETON, Oxford University

Agriculture under Krushchev

LAZAR VOLIN, U. S. Department of Agriculture

Soviet Foreign Economic Competition

JOSEPH BERLINER, Syracuse University

*Discussants:* RAYMOND P. POWELL, Yale University

ROBERT L. ALLEN, University of Virginia

CHAUNCEY HARRIS, University of Chicago

9:30 A.M. THE FUNDAMENTALS OF ECONOMIC PROGRESS IN UNDERDEVELOPED COUNTRIES

*Chairman:* THEODORE W. SCHULTZ, University of Chicago

*Papers:* Using the Resources at Hand More Efficiently

ARNOLD C. HARBERGER, University of Chicago

Adding to the Stock of Physical and Human Capital

RICHARD B. GOODE, International Monetary Fund

Maintaining Order and Accommodating Economic Change

WILLIAM H. NICHOLLS, Vanderbilt University

*Discussants:* BENJAMIN HIGGINS, Massachusetts Institute of Technology

ALEXANDRE KAFKA, United Nations

GEORGE E. BRITWELL, University of Saskatchewan

2:30 P.M. SOVIET ECONOMIC PLANNING

*Chairman:* EVSEY D. DOMAR, Massachusetts Institute of Technology

*Papers:* Industrial Price Formation

GREGORY GROSSMAN, University of California

Industrial Reorganization of 1957

OLEG HOEFFDING, Rand Corporation

*Discussants:* ROBERT CAMPBELL, University of Southern California

DAVID GRANICK, Carnegie Institute of Technology

**2:30 P.M. THE ROLE AND CHARACTER OF FOREIGN AID***Chairman:* WILLARD L. THORP, Amherst College*Papers:* Problems of Foreign Aid Viewed from the Inside

C. TYLER WOOD, International Cooperation Administration

Problems of Foreign Aid Viewed from the Outside

HARLAN CLEVELAND, Maxwell Graduate School of Citizenship and Public Affairs

Agricultural Surplus and Foreign Aid

JOHN H. DAVIS, Harvard University

*Discussants:* To be announced**2:30 P.M. ROUND TABLE ON THE ORGANIZATION AND FINANCING OF ECONOMIC RESEARCH***Chairman:* SEYMOUR E. HARRIS, Harvard University*Participants:* THOMAS H. CARROLL, Ford Foundation

PHILIP H. COOMBS, Fund for Advancement of Education

SOLOMON FABRICANT, National Bureau of Economic Research

TJALLING KOOPMANS, Yale University

LLOYD REYNOLDS, Yale University

*Discussion from the floor.***5:00 P.M. Cocktail Hour****8:00 P.M. THE NON-RUSSIAN COMMUNIST ECONOMIES***Chairman:* MAX F. MILLIKAN, Massachusetts Institute of Technology*Papers:* Structural Changes in the Economy of the Chinese Mainland, 1933-1957

TA-CHUNG LIU, Rand Corporation and Cornell University

The Polish Economy after October 1956

ALEXANDER ERLICH, Columbia University

Integration of European Satellite Economies with the Russian Economy

EDWARD AMES, Purdue University

*Discussants:* NICOLAS SPULBER, Indiana University

WILLIAM W. HOLLISTER, Washington, D.C.

THAD P. ALTON, Columbia University

**8:00 P.M. MAINTAINING FULL EMPLOYMENT AND ECONOMIC STABILITY***Chairman:* ROBERT AARON GORDON, University of California, Berkeley*Papers:* The 1957-58 Business Contraction in the Light of its Predecessors

GEOFFREY H. MOORE, National Bureau of Economic Research

The Problem of Price Stabilization

JOHN P. LEWIS, Indiana University

*Discussants:* MARTIN R. GAINSBURGH, National Industrial Conference Board

J. HOWARD CRAVEN, Bank of America, San Francisco

FRANK E. NORTON, University of California, Los Angeles

**8:00 P.M. THE ECONOMICS OF GOVERNMENT EXPENDITURES***Chairman:* CHARLES J. HITCH, Rand Corporation*Papers:* Using Market Mechanisms in Making Government Expenditure DecisionsO. H. BROWNLEE, University of Minnesota  
An Economist Looks at Defense

ALBERT WOHLSTETTER, Rand Corporation

*Discussants:* KLAUS E. KNORR, Princeton University

JACK HIRSHLEIFER, University of Chicago

*Sunday, December 28, 1958*

**9:00 A.M. STUDIES IN THE CLASSICAL ECONOMICS**

*Chairman:* JOHN PERRY MILLER, Yale University

*Papers:* What Was the Labor Theory of Value?

DONALD F. GORDON, University of Washington

The Relevance of Classical and Contemporary Theories of Growth to Economic Development

JOHN M. LETICHE, University of California, Berkeley

*Discussants:* ROBERT E. BALDWIN, University of California, Los Angeles

WILLIAM J. FELLNER, Yale University

FRIEDRICH A. HAYEK, University of Chicago

**9:00 A.M. POWER BLOCS AND THE OPERATION OF ECONOMIC FORCES**

*Chairman:* GEORGE J. STIGLER, University of Chicago

*Papers:* Economics by Admonition

BEN W. LEWIS, Oberlin College

Economics by Negotiation

GEORGE H. HILDEBRAND, University of California, Los Angeles

*Discussants:* CALVIN B. HOOVER, Duke University

Second discussant to be announced.

**9:00 A.M. SPECIAL PROBLEMS FACING UNDERDEVELOPED COUNTRIES**

*Chairman:* KENT T. HEALY, Yale University

*Papers:* Transportation's Role in Economic Development

WILFRED OWEN, Brookings Institution

Labor Force Development in Industrializing Countries

BEN S. STEPHANSKY, Bureau of Inter-American Affairs, Department of State

*Discussants:* To be announced.

**2:30 P.M. ADMINISTERED PRICES RECONSIDERED**

*Chairman:* FRITZ MACHLUP, Johns Hopkins University

*Papers:* Administered Prices and the Inflationary Process

GARDNER ACKLEY, University of Michigan

Administered Prices: A Phenomenon in Search of a Theory

JOHN M. BLAIR, Chief Economist, Subcommittee on Antitrust and Monopoly, Committee on the Judiciary, U. S. Senate

*Discussants:* RICHARD T. SELDEN, Vanderbilt University

MARTIN J. BAILEY, University of Chicago

WROE ANDERSON, Alderson Associates, Inc., Philadelphia, Pennsylvania

GARDINER C. MEANS, Washington, D. C.

**2:30 P.M. INTERNATIONAL TRADE AND PAYMENTS IN AN ERA OF CO-EXISTENCE**

*Chairman:* GARDNER PATTERSON, Princeton University

*Papers:* Commercial Policy in the Underdeveloped Countries

RAOUL PREBISCH, United Nations, Economic Commission for Latin America

Disequilibrium in the Balance of Payments

RANDALL W. HINSHAW, Oberlin College

*Discussants:* HENRY G. AUBREY, National Planning Association

EUGENE R. SCHLESINGER, New York University

**2:30 P.M. REGIONAL ECONOMICS AND INDUSTRIAL LOCATION (Joint session with Regional Science Association)**

*Chairman:* To be announced

*Papers:* A Statistical and Analytical Technique for Regional Analysis

EDGAR S. DUNN, University of Florida

## THE AMERICAN ECONOMIC REVIEW

Changes in the Location of United States Manufacturing Since 1929

VICTOR FUCHS, Columbia University

*Discussants:* To be announced

8:00 P.M. PRESIDENTIAL ADDRESS

*Chairman:* To be announced

Presidential Address

GEORGE W. STOCKING, Vanderbilt University

Monday, December 29, 1958

9:00 A.M. BALANCED ECONOMIC GROWTH IN HISTORY: A CRITIQUE (Joint session with Economic History Association)

*Chairman:* ALEXANDER GERSCHENKRON, Harvard University

*Papers:* Foreign Trade and Balanced Economic Growth: The Historical Framework

JONATHAN R. T. HUGHES, Columbia and Purdue University  
Domestic Aspects of Balanced Economic Growth in History

GORAN ÖHLIN, Stanford University

*Discussants:* RUDOLPH C. BLITZ, Vanderbilt University

THEODORE W. MORGAN, University of Wisconsin

9:00 A.M. CURRENT CRITICAL ISSUES IN WAGE THEORY AND PRACTICE (Joint session with the Industrial Relations Research Association)

*Chairman:* JOSEPH SHISTER, University of Buffalo

*Papers:* Wage Structure and Resource Allocation

HARRY M. DOUTY, U. S. Bureau of Labor Statistics

Wage-Push Inflation

WALTER A. MORTON, University of Wisconsin

Wage Policy and Business Activity

To be announced.

*Discussants:* To be announced.

9:00 A.M. Joint session with American Farm Economic Association

*Chairman:* ROBERT L. CLODIUS, University of Wisconsin

Details to be announced

9:00 A.M. SELECTED PAPERS—OPEN COMPETITION

*Chairman:* WILLIAM J. FELLNER, Yale University

*Papers:* To be announced

12:30 P.M. Joint Luncheon Session with American Statistical Association

*Chairman:* RALPH E. BURGESS, American Cyanamid Company

*Address:* The Economic Outlook

To be announced

2:30 P.M. SELECTED PROBLEMS IN ECONOMIC THEORY (Joint Session with Econometric Society)

*Chairman:* EDWIN KUH, Massachusetts Institute of Technology

*Papers:* Economic Growth, Fluctuation, and Stability

ALBERT K. ANDO, Massachusetts Institute of Technology

FRANCO MODIGLIANI, Carnegie Institute of Technology

The Demand for Money—Some Theoretical and Empirical Results

MILTON FRIEDMAN, University of Chicago

*Discussants:* To be announced

2:45 P.M. CURRENT TRENDS IN PUBLIC POLICY TOWARD BUSINESS (Joint session with American Marketing Association)

*Chairman:* CORWIN D. EDWARDS, University of Chicago

*Papers:* The Present Legal Environment of Growth Through Merger

PAUL W. COOK, JR., Harvard University

The Law and Economics of Price Discrimination—A Reappraisal

MARK MASSEL, Brookings Institution

The Role of Cost in Public Policy Towards Business

H. F. TAGGART, University of Michigan

*Discussants:* HOWARD WESTING, University of Wisconsin

JOHN S. MCGEE, University of Chicago

JOHN T. WHEELER, University of California, Berkeley

5:00 P.M. Business Meeting

6:00 P.M. Executive Committee Dinner Meeting

#### AMENDMENTS TO THE BYLAWS OF THE AMERICAN ECONOMIC ASSOCIATION

The following proposed amendments were approved at the Executive Committee meeting of the Association, April 4-5, 1958.

##### Section III. *Officers.*

Amend Paragraph 1 to read:

1. The Association shall have the following officers who shall be elective officers: a President, a First Vice-President, two additional Vice-Presidents, and six elected members of the Executive Committee. The terms of office of the President and the three Vice-Presidents shall each be one year. The terms of office of the six elected members of the Executive Committee shall each be three years, two of the six terms to expire each year. The First Vice-President elected in any year shall succeed to the presidency in the following year. Each regular term of office shall coincide with the calendar year or a multiple thereof.

Delete Paragraph 2 and substitute the following paragraphs, respectively, for Paragraphs 3, 4, 5.

2. Elective officers shall be chosen through elections to be held during the last three months of the terms of office of their predecessors. Each member shall be given the opportunity to vote by mail. The results of the election shall be certified and announced by the Secretary at the annual business meeting.

3. The Association shall have the following officers who shall be appointed by the Executive Committee: a Secretary, a Treasurer, a Managing Editor, and a Counsel. The terms of office of each of these officers shall be three calendar years.

4. The Executive Committee shall consist of the President, the three Vice-Presidents, the Secretary, the Treasurer, the Managing Editor, the two ex-Presidents who have last held office, and six elected members, provided that the Secretary, the Treasurer, and the Managing Editor shall not be entitled to vote in the Committee's meetings.

##### Section IV. *Duties of Officers.*

Amend by the insertion of a new paragraph 2 to read:

2. Before October 1 of each year, the First Vice-President of the Association shall appoint a Nominating Committee for the following year, this Committee to consist of a past officer as Chairman and not less than five other members of the Association. The names of the Committee shall be published in the issue of the *American Economic Review* immediately following their appointment, together with an invitation to the general membership that suggestions of nominees for the various offices other than the presidency be sent to the Chairman of the Committee. The Nominating Committee for each year shall be instructed to present to the Secretary of the Association on or before September 1 a nominee for the first vice-presidency and two or more nominations for each other elective office

to be filled, except the presidency, all these nominees being members of the Association. The members of the Nominating and Executive Committees shall constitute an Electoral College which shall consider the nominee of the Nominating Committee for the first vice-presidency and select a single candidate for that office; but space shall be provided on the ballot for that office for the individual voter's alternative choice.

The First Vice-President may, at his discretion and with the advice and consent of the Executive Committee, appoint a Program Committee for the annual meeting of the succeeding year.

After this new Paragraph 2 to Section IV would follow the present Paragraphs 2, 3, 4, 5, and 6, but renumbered 3, 4, 5, 6, and 7 except to amend the new Paragraph 6 to read:

The Managing Editor shall, with the advice and consent of the Executive Committee, appoint members to an Editorial Board to assist him. He shall be ex-officio member and chairman of this Board. The Editorial Board shall have charge of the publication of the *American Economic Review*.

It was voted that the proposed amendments to the Charter and Bylaws be approved and become effective upon ratification by the members and will be controlling in the election of Presidents, beginning with the President for the year 1961, and for all other elective officers whose terms of service begin in the year 1960.

It was voted to authorize the Secretary to prepare a mail ballot concerning the amendments, to be included with the ballots for the election of the officers in November, and to report the result at the December meeting of the Association.

#### FELLOWSHIPS AND GRANTS

The Social Science Research Council is again offering during the coming year predoctoral and postdoctoral research training fellowships, grants-in-aid of research and faculty research grants. Prospective candidates are urged to write to the Social Science Research Council, 230 Park Avenue, New York 17, N.Y. as early as possible to be assured of receiving a detailed announcement.

In addition to these offerings, for which individuals may apply, nominations are invited for: faculty research fellowships, providing part-time release from teaching for a term of three years and available to a few college and university faculty members; senior research awards in American government affairs, providing maintenance and research expenses for one year to about five distinguished scholars; and auxiliary research awards to be awarded to about 25 younger social scientists selected on the basis of past achievement and future promise of significant research.

#### NEW PUBLICATION

The Department of Economic and Social Affairs, United Nations, published in April 1958 the first issue of a new publication *Industrialization and Productivity*. It will concentrate on "the practical problems of the planning and execution of industrial projects," and is designed particularly to serve the interests of "officials in governmental and non-governmental organizations, such as finance and economic ministries, development boards and technological institutes concerned with industrialization, as well as . . . technical assistance experts, plant managers and others actively involved in promoting industrialization." Columbia University Press is the distribution agent.

#### ANNOUNCEMENTS

The Universities-National Bureau of Economic Research is currently exploring the possibilities of a conference on Economic Aspects of Research and Technological Development. Any information as to research projects, underway or planned, that might contribute to

such a conference would be appreciated. Communications should be addressed to Richard R. Nelson, Economics Division, the RAND Corporation, 1700 Main Street, Santa Monica, California.

The Division of Forest Economics and Policy of the Society of American Foresters is compiling a directory of people in the United States and Canada who are working currently in the general area of the economics of forestry. Anyone whose present work or interest is related to the economics of production, harvesting, processing, marketing or consumption of forest products and services should write to Professor A. C. Worrell, 360 Prospect Street, New Haven 11, Connecticut, for a data sheet.

The University of Illinois has purchased the economics library of Jacob Hollander, late professor of the Johns Hopkins University. This collection ranks among one of the best private collections of works in economics.

### *Visiting Foreign Scholars*

R. G. D. Allen of the London School of Economics, University of London, has been appointed visiting research professor of economics at the University of California, Berkeley, for the current academic year.

Assar K. E. Lindback of the University of Stockholm has been appointed visiting assistant professor of economics at the University of Michigan for the first semester of the current academic year.

James Potter of the London School of Economics has been appointed acting associate professor of economics at the University of North Carolina for the current academic year.

J. Denis Sargan of Leeds University, England, is serving as visiting professor of economics at the University of Michigan for the current year.

J. H. Brian Tew of the University of Nottingham has been appointed visiting professor of economics at Yale University for the first semester of the current academic year.

Peter Vandome of the Oxford Institute of Statistics has been appointed visiting lecturer at the University of Kentucky.

Aydin Yalcin of the University of Ankara has been appointed visiting associate professor of economics at Columbia University for 1958-59.

### *Retirements*

A. Bruce Anthony has been named professor emeritus of economics at Mercer University.

Z. Clark Dickinson, professor of economics at the University of Michigan, has retired.

Cecil R. Graves, associate professor of accounting and finance at the Illinois Institute of Technology, has retired.

H. Gordon Hayes has retired from Tulane University. He is now professor of economics, emeritus, at both Tulane University and Ohio State University.

Samuel M. Levin has been named professor of economics, emeritus, at Wayne State University.

Robert L. Masson has been named professor emeritus at Harvard Graduate School of Business Administration.

Broadus Mitchell has retired as professor of economics from Rutgers—The State University.

Carl F. Remer, professor of economics at the University of Michigan, has retired.

Hazel V. Roberts has retired from Hunter College.

Lawrence Smith, Stephen Greene professor of economics at Wellesley College, has retired as of June 1958.

Marie W. Spencer has retired from the Illinois Institute of Technology.

Albion G. Taylor has been appointed emeritus Chancellor professor of political economy at the College of William and Mary.

Francis D. Tyson, professor of industry and economics, has retired from the School of Business Administration, University of Pittsburgh.

Ross G. Walker has become professor emeritus at the Harvard Graduate School of Business Administration effective August 31, 1958.

Leo Wolman has retired as professor of economics at Columbia University.

### *Deaths*

James Baster died August 23, 1957.

Hiram L. Jome of DePauw University died last spring.

Edwin A. Lamke died in September 1957.

Cleona Lewis, who served on the staff of the Brookings Institution until her retirement in 1950, died May 5, 1958.

Edmond E. Lincoln, economist for the Du Pont Company until his retirement in 1953, died May 15, 1958.

M. O. Phillips of Washington and Lee University died March 28, 1958.

Lloyd P. Rice, professor emeritus of economics at Dartmouth College, died May 10, 1958.

### *Appointments and Resignations*

Warren E. Adams, formerly at Swarthmore College, has been appointed assistant professor of economics at The University of Texas.

J. P. Allen has been appointed associate professor of economics at DePauw University.

Laird B. Allison has been promoted to assistant professor of industrial management at Los Angeles State College.

Arthur T. Anderson of Harvard University has been appointed instructor in economics at the University of Maryland.

Edward M. Anson is executive director of the Iowa College Foundation.

Hector Anton, formerly of the University of California, Berkeley, is a visiting professor at the University of Minnesota.

David A. Baerncopf has been appointed assistant professor of business economics in the School of Business Administration, University of Oregon.

Eric N. Baklanoff of Ohio State University has been appointed assistant professor of foreign trade at Louisiana State University.

Alexander S. Balinky has been promoted to associate professor of economics at Rutgers—The State University.

George B. Baldwin has resigned from Vanderbilt University to accept a position as general economist and assistant field project supervisor with Harvard's Iran Advisory Project in Tehran.

William L. Baldwin has been promoted to assistant professor of economics at Dartmouth College.

Louis B. Barnes has been appointed assistant professor of business administration in the Harvard Graduate School of Business Administration.

William P. Baxter has been appointed professor of financial accounting in the Graduate School of Business, Columbia University.

J. B. Bearnsen, retired from the University of Utah in 1953, has been reappointed professor of economics at Birmingham-Southern College for the current academic year.

Garnett Beazley has been appointed assistant professor of accounting in the School of Business Administration of the University of Pittsburgh for 1958-59.

Carolyn S. Bell has been promoted to associate professor of economics at Wellesley College.

James R. Bentley, formerly of the University of Washington, has joined the faculty of the University of Minnesota as lecturer.

William Bentsen of the University of Wisconsin has been appointed assistant professor of economics at Beloit College.

Joseph S. Berliner has been promoted to associate professor in the department of economics, Syracuse University.

R. Glen Berryman, formerly of the University of Illinois, has joined the faculty of the University of Minnesota as assistant professor.

John W. Birch of The Johns Hopkins University has been appointed instructor in the department of economics, University of Illinois.

J. O. Blackburn has been appointed interim instructor in economics at the University of Florida.

Arthur I. Bloomfield has resigned from the Federal Reserve Bank of New York to become professor of economics and finance at the University of Pennsylvania.

Francis M. Boddy of the University of Minnesota participated in the Salzburg Seminar in American Studies during the winter 1958.

Joseph M. Bonin has accepted an appointment as assistant professor of economics at the University of Arkansas.

Gene Booker of the University of Indiana has been appointed assistant professor of economics at Washington and Jefferson College.

Neil H. Borden, Jr. has been promoted to research associate in business administration in the Harvard Graduate School of Business Administration.

Bodo Böttcher has resigned from the International Monetary Fund to accept an appointment as assistant to the executive president of the National Association of Electrical Industries in Frankfurt am Main, Germany.

James B. Boulden has been appointed assistant professor of transportation and production management in the School of Business Administration, University of California, Los Angeles.

Roger L. Bowlby has been appointed assistant professor in the department of economics and Labor and Industrial Relations Center, Michigan State University.

James E. Boyce has been appointed lecturer on business administration in the Harvard Graduate School of Business Administration.

Stanley E. Boyle of the University of Wisconsin has been appointed assistant professor of economics at Saint Louis University.

Floyd S. Brandt has been promoted to research associate in business administration in the Harvard Graduate School of Business Administration.

J. Herman Brasseaux is associate professor of accounting at Louisiana Polytechnic Institute.

Elmer C. Bratt has been appointed head of the department of economics and sociology, succeeding Herbert M. Diamond, at Lehigh University.

William G. Brokaw has accepted a position as instructor in economics at Lafayette College.

Martin Bronfenbrenner, formerly of Michigan State University, has been appointed professor of economics at the University of Minnesota effective December 1958.

Robert C. Brooks, Jr. of the University of Georgia will join the faculty of Vanderbilt University as assistant professor of business administration February 1, 1959.

Milton P. Brown, 2d has been promoted to professor of business administration in the Harvard Graduate School of Business Administration.

Yale Brozen has been appointed director of research in the School of Business, University of Chicago.

Heinrich H. Bruschke has been appointed instructor in economics at the University of Minnesota.

Anthony J. Bryski of Lehigh University has become head of the Bureau of Research and Statistics, Department of Labor and Industry, State of Pennsylvania.

Dale E. Butz is visiting research professor in the Harvard Graduate School of Business Administration.

Carl C. Cabe, formerly of the University of Illinois, has been appointed associate professor of economics at the University of Kentucky.

James Cairns has been appointed instructor in the department of political economy at the Johns Hopkins University.

James A. Caldwell has accepted an appointment as associate professor at Georgia Institute of Technology.

Rondo E. Cameron of the University of Wisconsin is at the Center for Advanced Study in the Behavioral Sciences, Stanford, California, in the current academic year.

Thomas C. Campbell has been promoted to professor of economics in the College of Commerce, West Virginia University.

David S. Carlson has been appointed instructor of urban land studies, School of Business Administration, University of Pittsburgh.

Paul M. Carrick, Jr., formerly of San Diego State College, has been appointed acting assistant economist in the Bureau of Economic and Business Research, State College of Washington.

John J. Carroll has been promoted to professor and chairman of the department of economics and business administration at St. Lawrence University.

Edward H. Chamberlin has resigned as editor of the *Quarterly Journal of Economics* as of June 1958. Arthur Smithies will be the new editor.

Paul W. Cherington has been promoted to professor of business administration in the Harvard Graduate School of Business Administration.

Frank C. Child has been promoted to associate professor of economics at Michigan State University.

Carl R. Christensen has been promoted to professor of business administration in the Harvard Graduate School of Business Administration.

James V. Clark has been promoted to assistant professor of business administration in the Harvard Graduate School of Business Administration.

Richard V. Clemence has been promoted to professor of economics at Wellesley College.

Meredith O. Clement has been promoted to assistant professor of economics at Dartmouth College.

Ronald H. Coase has been appointed professor of economics at the University of Virginia. He will be on leave in 1958-59 at the Center for Advanced Study in the Behavioral Sciences, Stanford, California.

E. Kennedy Cobb has been appointed assistant professor of accounting at Los Angeles State College.

Edward Coen, on leave from the University of Minnesota this year, is visiting associate professor of economics at the University of California, Berkeley.

David C. Cole of the University of Michigan has accepted an appointment as assistant professor of economics and associate director of the Graduate Training Program in Economic Development at Vanderbilt University.

Alan B. Coleman has been appointed research associate in business administration in the Harvard Graduate School of Business Administration.

Lorne D. Cook has been promoted to associate professor of economics at Pomona College.

Albert R. Cox of Baylor University has accepted an appointment as assistant professor of accounting at Los Angeles State College.

Rupert Craig has been appointed assistant professor of finance at Los Angeles State College.

Joseph Cropsey has resigned from the City College.

Donald E. Cullen has been promoted to associate professor of industrial and labor relations at Cornell University.

C. C. Curtis, formerly at Rensselaer Polytechnic Institute, has been appointed assistant professor of real estate at the University of Florida.

Darwin W. Daicoff has been appointed instructor in economics at the University of Michigan.

Donald C. Darnton has been appointed instructor in economics at the University of Michigan.

Ansis L. Darzins has been appointed instructor in economics at the University of Minnesota.

Paul Davidson has been appointed assistant professor of economics at Rutgers—The State University.

Sidney Davidson has been appointed professor of accounting in the School of Business, University of Chicago.

Keith Davis has resigned from Indiana University to accept an appointment at Arizona State College.

John S. deBeers has been appointed lecturer in economics at the University of Maryland.

Walter H. Delaplane has resigned from Texas A & M to accept the deanship of the College of Arts and Sciences of Southern Methodist University.

Harold Demsetz of Northwestern University has been appointed lecturer in economics at the University of Michigan.

Nancy Depew has been appointed instructor at Carnegie Institute of Technology.

C. T. Devine, on a year's leave from the University of Florida, is visiting professor at the University of California, Berkeley.

Salvatore F. Divita has been named research associate in the Harvard Graduate School of Business Administration.

C. H. Donovan of the University of Florida has accepted a Fulbright lectureship at Karnatak University, India.

Robert Eisner of Northwestern University is at the Cowles Foundation for Research in Economics, Yale University, in the fall quarter.

James R. Elliott, Jr. has resigned from Denison University to enter private business.

Paul T. Ellsworth, now in Paris completing work as chief of a World Bank Economic Survey Mission in Thailand, will return to the University of Wisconsin in January 1959.

Emerson C. Erb, Jr. has resigned from the School of Business, Indiana University.

Herman Erickson has been promoted to professor of labor and industrial relations in the Institute of Labor and Industrial Relations, University of Illinois.

Franklin B. Evans has been appointed instructor in marketing in the School of Business, University of Chicago.

Tibor Fabian has resigned from the School of Business Administration, University of California, Los Angeles to accept a position in the firm of Lybrand, Ross Bros. and Montgomery.

Oladunjoye Fashola has been appointed instructor in economics at Baldwin-Wallace College.

John Fayerweather has been appointed adjunct associate professor of international business in the Graduate School of Business, Columbia University.

William W. Fearnside has been appointed assistant professor of business administration in the Harvard Graduate School of Business.

Rashi Fein, who has been promoted to associate professor of economics at the University of North Carolina, has been given a year's leave of absence to take a position as statistician with the Department of Commerce, Washington, D.C.

Max Fessler has been promoted to a full professorship in the School of Business, University of Kansas.

Thomas Finn has been promoted to assistant professor of economics at Dartmouth College.

Gerald P. Foster has accepted an appointment as assistant professor of management at Los Angeles State College.

W. M. Fox of the University of Florida is a Fulbright lecturer at the Helsinki School of Economics, Helsinki, Finland.

George N. Francis has been promoted to professor of accounting at Los Angeles State College.

Andrew G. Frank has been appointed assistant professor of economics at Michigan State University.

Helmuth J. Frank has been appointed instructor in economics at Princeton University.

Earl S. Fullbrook has resigned from the deanship of the College of Business Administration, University of Nebraska, but is continuing teaching as professor of marketing.

Eirik Furubotn has resigned from Rensselaer Polytechnic Institute to accept a position as instructor in economics at Lafayette College.

Daniel R. Fusfeld has been promoted to associate professor of economics at Michigan State University.

George Garvy, senior economist at the Federal Reserve Bank of New York, has been appointed adviser. He is now a part-time member of the staff of the Economic Development Institute, Washington, D.C.

R. C. Geary, of the UN Statistical Office has been appointed visiting professor in the department of economics of the Graduate Faculty, New School for Social Research, for the fall term.

Franz Gehrels has been promoted to associate professor in the department of economics, Indiana University.

Dwight L. Gentry has been promoted to professor of marketing administration in the College of Business and Public Administration, University of Maryland.

Nicholas Georgescu-Roegen of Vanderbilt University is doing research and lecturing at the Institute of European Studies in Turin, Italy, under a Guggenheim fellowship and Fulbright grant.

James A. Gherity, Jr. has been promoted to assistant professor of economics at Michigan State University.

Charles Gilbert has resigned from New York University to accept a position as chairman of the economics department and director of the graduate division of business administration of the University of Hartford.

Nicholas A. Glaskowsky has been promoted to assistant professor at the University of Minnesota.

William S. Gomberg has been appointed visiting professor of industrial relations, Graduate School of Business, Columbia University.

Bernard Goodman has been promoted to associate professor of economics at Wayne State University. He is on leave this year for research and study at Yale University.

Wendell C. Gordon has been promoted to professor of economics at the University of Texas.

Robert Graves has been appointed assistant professor of applied mathematics in the

School of Business and associate director of the Operations Analysis Laboratory, University of Chicago.

Seymour Gray has been promoted to assistant professor of accounting in the department of business and economics, Illinois Institute of Technology, Chicago, Illinois.

Charles J. Grayson, Jr. has been named lecturer on business administration in the Harvard Graduate School of Business.

Leo Grebler has been appointed professor of real estate and urban land economics in the School of Business Administration, University of California, Los Angeles.

David Green has been promoted to associate professor of accounting and appointed director of the downtown program, School of Business, University of Chicago.

William C. Greene has been promoted to research associate in business administration in the Harvard Graduate School of Business Administration.

Peter Gregory of Yale University has been appointed assistant professor of economics at the University of Minnesota.

Frank C. Hachman has been appointed acting instructor in economics at the State College of Washington.

Josef Hadar has been appointed instructor in economics at the University of Minnesota.

Herbert R. Hahn has been appointed visiting assistant professor in the department of economics and business administration, Duke University.

A. Stuart Hall has been appointed chairman of the department of economics in the College of Business Administration, University of Nebraska.

Marcia L. Halvorsen has been appointed instructor in economics at the University of Minnesota.

C. Lowell Harris has been promoted to professor of economics at Columbia University. He is serving as U. S. correspondent for the Institut d'Etudes du Developpement Africain in which connection he recently participated in a conference in Paris on financing Algerian economic development.

Delbert C. Hastings, formerly with the Federal Reserve Bank of St. Louis, has joined the faculty of the University of Minnesota as an associate professor.

Paul G. Hastings has been named to the Fort Worth National Bank Chair of Finance in the School of Business of Texas Christian University.

Victor C. Heck has been named John D. Stetson professor of economics at Mercer University.

W. A. Heffelfinger has accepted an appointment with the Bureau of Business and Economic Research in the College of Business Administration, University of Arkansas.

Eduard Heimann, professor emeritus of the New School for Social Research, has been appointed visiting professor of economics at the University of California, Berkeley, for the fall semester.

Richard M. Heins has resigned from the University of California, Los Angeles, to accept a position as professor of insurance, University of Wisconsin.

George Heitman has been appointed instructor in economics at The Pennsylvania State University.

Walter W. Heller is serving as chairman of the department of economics, University of Minnesota, 1957-59.

William F. Hellmuth, Jr. of Oberlin College will be visiting professor at the University of Wisconsin the second semester 1958-59 and the summer of 1959.

Irwin L. Herrnsstadt, formerly of the Massachusetts Institute of Technology, has been appointed assistant professor of economics in the College of Commerce, West Virginia University.

Benjamin Higgins has been granted a leave of absence for the fall semester from the Center for International Studies, Massachusetts Institute of Technology, to serve as visiting professor of economics at the University of Texas.

Donald R. Hodgman of the University of California, Berkeley, has been appointed associate professor of economics at the University of Illinois.

Morton Hoffman has resigned from the Baltimore Urban Renewal and Housing Agency to become an urban and economic consultant in the same city.

James R. Holcomb has been appointed instructor in industry, School of Business Administration, University of Pittsburgh.

Hendrik S. Houthakker of Stanford University has been appointed visiting professor of economics at Harvard University for the year 1958-59.

John A. Howard has resigned from the School of Business, University of Chicago, to become professor of marketing at the University of Pittsburgh.

Charles W. Howe has been appointed assistant professor of economics at Purdue University.

John M. Hunter has been promoted to professor of economics at Michigan State University. He is on leave this year to be director of the newly organized Institute of Economic Research, University of the Andes, Bogotá, Colombia.

Patrick Huntley has resigned from Duke University to be lecturer in economics and assistant to the dean at the University of Arizona.

John R. T. Hughes has been promoted to associate professor of economics at Purdue University.

William Iulo, formerly of the University of Wisconsin, has been appointed assistant economist in the Bureau of Economic and Business Research, State College of Washington.

James E. Jacobson has been appointed instructor at the University of Minnesota.

John E. Jeuck of the Harvard Graduate School of Business Administration has been appointed professor of business administration and Robert Law professor of business administration at the University of Chicago School of Business.

Dudley W. Johnson has been promoted to assistant professor of economics at Lehigh University.

C. Clyde Jones has been promoted to associate professor in the department of economics, University of Illinois.

Howard L. Jones has been appointed professor of statistics in the School of Business, University of Chicago.

Dale W. Jorgenson of Harvard University will be acting assistant professor of economics at the University of California, Berkeley, in the spring semester 1959.

M. J. Kafoglis of Ohio State University has been appointed assistant professor of economics at the University of Florida.

Alfred E. Kahn has been appointed chairman of the department of economics, Cornell University.

C. Harry Kahn has been appointed associate professor of economics in the College of Arts and Sciences, Rutgers—The State University.

D. L. Kemmerer of the University of Illinois has been teaching at the University of Melbourne, Australia, since June.

Peter Kenen has been promoted to assistant professor at Columbia University.

Maurice D. Kilbridge has been appointed professor of production in the School of Business, University of Chicago.

James Kindahl has been appointed assistant professor in political economy at the Johns Hopkins University.

Philip A. Klein has been promoted to assistant professor of economics in The Pennsylvania State University.

Anthony Y. C. Koo has been promoted to professor of economics at Michigan State University.

Adamantia P. Koslin is visiting professor of economics at the University of Oklahoma.

Lawrence B. Krause has been promoted to assistant professor of economics at Yale University.

Leon E. Krouse has been promoted to assistant professor of finance at Lehigh University.

David S. Landes has been appointed professor of history and economics at the University of California, Berkeley.

Henry W. Laurant is industrial economist at Stanford Research Institute, Menlo Park, California.

Warren A. Law has been appointed lecturer on business administration in the Harvard Graduate School of Business.

Leonard L. Lederman is now staff economist with the Chamber of Commerce of the United States.

John D. Lehman has been appointed assistant professor of economics at Denison University.

Abba P. Lerner of Roosevelt University has been appointed visiting professor of economics for 1958-59 at the University of California, Berkeley.

Selig D. Lesnoy has been appointed instructor in economics at the University of Michigan.

Stuart Levow of the University of Michigan has been appointed instructor in economics at Washington and Jefferson College.

H. H. Liebhafsky has been promoted to associate professor of economics at the University of Texas.

Ta-Chung Liu has been appointed professor of economics at Cornell University.

Kullervo Louhi has resigned from the University of Chicago to become professor of business administration and associate dean of the College of Business and Public Service, Michigan State University.

Michael C. Lovell has been appointed instructor in economics at Yale University.

John W. Lowe has resigned from the University of Florida to accept a professorship at Arizona State College.

Stanley T. Lowry is assistant professor of economics at East Carolina College.

Myles L. Mace has been appointed professor of business administration in the Harvard Graduate School of Business Administration.

Duncan MacIntyre has been promoted to professor of industrial and labor relations in the New York State School of Industrial and Labor Relations, Cornell University.

H. David Maloney has been promoted to associate professor of economics at DePauw University.

Karl O. Mann has accepted an appointment as associate professor of personnel and industrial relations in the College of Business Administration, University of Toledo.

Charles F. Marsh has resigned from the College of William and Mary to become president of Wofford College.

David D. Martin has been appointed visiting associate professor of business economics and public policy in the School of Business, Indiana University.

Norman H. Martin has been promoted to professor of industrial relations in the School of Business, University of Chicago.

Mark S. Massel, formerly with Bell, Boyd, Marshall, and Lloyd of Chicago, has joined the senior staff of the Brookings Institution.

John B. Matthews, Jr. has been promoted to associate professor of business administration in the Harvard Graduate School of Business Administration.

Raymond R. Mayer has been appointed associate professor of management in the department of business and economics, Illinois Institute of Technology.

John F. McLaren of the University of Ohio has accepted an appointment as assistant professor of accounting at Los Angeles State College.

Walter S. Measday is on leave from the University of Maryland to serve as a member of the professional staff of the Subcommittee on Antitrust and Monopoly of the Senate Judiciary Committee.

John A. Menge has been promoted to assistant professor of economics at Dartmouth College.

Frederic Meyers of the University of Texas has been appointed professor of Industrial relations in the School of Business Administration, University of California, Los Angeles.

Charles S. Miller has been appointed dean of the College of Business Administration, University of Nebraska.

Jerry Miner of the University of Michigan has been appointed assistant professor of economics at Syracuse University.

Hyman P. Minsky has resigned from Brown University to accept an appointment as assistant professor of economics at the University of California, Berkeley.

C. Clyde Mitchell has been a member of the Harvard Advisory Group to the Pakistan Planning Board since October 1957. Since February 1958 he has been acting field supervisor of the Group in addition to adviser in finance and international trade.

Broadus Mitchell has been appointed John Hay Whitney professor of economics at Hofstra College for 1958-59.

Wiley S. Mitchell has been promoted to a full professorship in the School of Business, University of Kansas.

John M. Montias has been promoted to assistant professor of economics at Yale University.

William M. Morgenroth has been appointed instructor in the School of Business Administration, University of Pittsburgh.

Anthony R. Morici has been appointed instructor in accounting in the department of business and economics at Illinois Institute of Technology.

Morris D. Morris has been promoted to associate professor at the University of Washington.

Irving Morrissett has been promoted to associate professor of economics at Purdue University.

Jacob L. Mosak of the United Nations has been appointed visiting professor of economics at Columbia University for 1958-59.

Robert A. Mundell of the University of British Columbia has been appointed acting assistant professor of economics at Stanford University.

Roger F. Murray has been appointed professor of finance in the Graduate School of Business, Columbia University.

Richard A. Musgrave of the University of Michigan has served as adviser to the Government of Burma in the past summer.

Simon Naidel is serving as acting chairman of the department of economics at American University.

Walter C. Neele has been appointed assistant professor of economics at the University of Texas.

Boyd L. Nelson has been promoted to associate professor of business administration in the College of Business and Public Administration, University of Maryland.

Edward G. Nelson has been appointed director of the Center for Research in Business at the University of Kansas.

Paul E. Nelson, Jr. has been promoted to professor of economics at Denison University.

Marc Nerlove has been appointed associate professor of economics and agricultural economics at the University of Minnesota.

John Neter has been promoted to a full professorship at the University of Minnesota.

W. E. Newbolt, formerly of Berea College, has been appointed instructor in accounting at the University of Florida.

Monroe Newman has been promoted to associate professor of economics and head of the department of economics, The Pennsylvania State University.

Sherwood W. Newton has been promoted to associate professor in the School of Business, University of Kansas.

James B. Nilsen has been appointed instructor at the University of Minnesota.

John C. Norby has been promoted to professor of economics at Los Angeles State College.

James H. Noren has been appointed instructor in economics at Princeton University.

David Novack has been appointed instructor in economics at Columbia University.

G. Warren Nutter has been promoted to professor of economics at the University of Virginia.

E. A. Nyquist has been promoted to associate professor in the department of commerce and economics, University of Vermont.

Bernard Okun, formerly with the RAND Corporation, has accepted an appointment as assistant professor of economics at Princeton University.

Allan L. Olson has been appointed instructor in economics at the University of Minnesota.

Donald R. Olson has been appointed instructor, University of Minnesota.

Alex Orden has been appointed professor of applied mathematics in the School of Business and director of the Operations Analysis Laboratory, University of Chicago.

Clifford F. Owen of the University of Virginia has been appointed associate professor of economics at the College of William and Mary.

Garland C. Owens has been appointed associate professor of accounting, Graduate School of Business, Columbia University.

Donald R. Paden has been promoted to professor in the department of economics, University of Illinois.

Hugh T. Patrick has been appointed lecturer in economics at the University of Michigan.

Benedict J. Pedrotti has been appointed instructor in economics at the University of Michigan.

Richard F. Peirce has resigned from the School of Business Administration, University of California, Los Angeles, to accept a business position.

Mark Perlman has been promoted to associate professor of political economy at the Johns Hopkins University.

Richard L. Pfister has been appointed instructor in economics at Dartmouth College.

Ralph W. Pfouts has been promoted to professor of economics at the University of North Carolina.

Clinton A. Phillips has resigned from the department of economics, The University of Tennessee.

Janus Poppe, formerly of Georgetown University, has been appointed lecturer in economics in the Far Eastern program of the University of Maryland.

Richard C. Porter has been promoted to assistant professor of economics at Yale University. He is on leave this year serving as visiting lecturer in the department of economics at the University of Bombay.

James T. S. Porterfield has been promoted to associate professor of Business Administration in the Harvard Graduate School of Business Administration.

James P. Quirk, formerly of the University of Minnesota, has been appointed instructor in economics at Purdue University.

Elton Rayack has resigned from the department of economics at The Pennsylvania State University.

Jim E. Reese is on a year's leave of absence from the University of Oklahoma to serve as economist for the Joint Council of Economic Education.

William C. Reher has been appointed assistant professor in economics at the State University of Iowa.

Archibald N. Reid has resigned from the department of economics and political science, University of Saskatchewan.

Richard Ridilla has been appointed assistant professor of accounting in the School of Business Administration, University of Pittsburgh.

Roderick H. Riley has been executive director of the Joint Economic Committee of the Congress of the United States since April 1958.

Warren Robinson has been appointed assistant professor of economics at The George Washington University.

David C. D. Rogers has been named assistant professor of business administration in the Harvard Graduate School of Business Administration.

Henry Rosovsky of the University of Chicago has been appointed acting assistant professor in the department of economics, University of California, Berkeley.

Van E. Rothrock has been appointed assistant professor in the School of Business, University of Kansas.

George G. Sause has been promoted to associate professor of economics at Lafayette College.

Eric Schenker has been appointed assistant professor, department of economics and Highway Traffic Safety Center, Michigan State University.

Richard Scheuch has been promoted to associate professor of economics at Trinity College.

Guy A. Schick from Harvard University has been appointed instructor in the department of economics, University of Illinois.

James R. Schlesinger has been promoted to associate professor of economics at the University of Virginia.

Edward B. Schmidt has resigned from the chairmanship of the department of economics to devote full time to research and teaching at the University of Nebraska.

Hans O. Schmitt, who has been in Indonesia under the University of California-University of Indonesia Economics Project, has accepted an appointment as instructor in economics at the University of Wisconsin.

Wilbert M. Schneider is treasurer of the Loma Linda Food Company in California.

M. C. Schnitzer of the University of Arkansas has been appointed instructor in economics, University of Florida.

Eli Schwarz has been promoted to associate professor of finance at Lehigh University.

Ira O. Scott has been appointed associate professor of finance in the Graduate School of Business, Columbia University.

Norton Seeber of the University of California is assistant professor of economics at Carnegie Institute of Technology.

Martin Segal has been appointed assistant professor of economics at Dartmouth College.

Joel Seidman has been appointed professor of social sciences in the School of Business, University of Chicago.

Richard T. Selden of Vanderbilt University has been appointed research associate at the National Bureau of Economic Research for 1958-59.

Lawrence H. Seltzer of Wayne University will be visiting professor of economics at the University of Michigan the second semester of the current academic year.

Ronald A. Shearer of Ohio State University has been appointed lecturer in economics at the University of Michigan.

David H. Shelton has been appointed assistant professor of economics and business administration at the University of Delaware.

Gerald W. Siegel has been appointed lecturer on business administration in the Harvard Graduate School of Business Administration.

Fred S. Silander has been appointed assistant professor of economics at DePauw University.

William B. Simpson, former editor of *Econometrica*, has been appointed assistant professor of economics and statistics at Los Angeles State College.

Richard H. Slavin has been appointed instructor in finance in the School of Business Administration, University of Pittsburgh.

Walter L. Slifer, of Carson-Newman College, has been appointed professor of economics at Mercer University.

Theodore H. Smith has resigned as dean of the School of Business Administration, Montana State University, to become dean of the Graduate School of Business of the Air Force Institute of Technology, Air University, Wright-Patterson Air Force Base, Ohio.

Vernon L. Smith has been promoted to associate professor of economics at Purdue University.

Warren L. Smith, on leave from the University of Michigan, is visiting lecturer at Harvard University.

Benson Soffer has been appointed assistant professor of industry, School of Business Administration, University of Pittsburgh.

Egon Sohmen has been appointed assistant professor of economics at Yale University.

Gerald F. Sorrensen has accepted an appointment as assistant professor of economics at Los Angeles State College.

Jared Sparks has resigned from Purdue University to accept an appointment as assistant professor of economics at the University of Arkansas.

Eldred C. Speck has been appointed assistant professor of accounting in the School of Business Administration, University of Miami.

George A. Spiva, Jr. has been appointed assistant professor of economics in the College of Business Administration, University of Tennessee.

Darrell Spriggs has been promoted to professor of economics in the College of Business Administration, University of Arkansas.

W. J. Stankiewicz of the University of British Columbia served this summer as senior economist with the Department of Transport, Government of Ontario.

Stanley W. Steinkamp of the University of Michigan has been appointed assistant professor of economics at the University of Illinois.

Harold W. Stevenson, formerly of Northwestern University, has joined the faculty of the University of Minnesota as an associate professor.

R. Stansbury Stockton has been appointed associate professor of management in the School of Business, Indiana University.

Wolfgang F. Stolper is on leave from the University of Michigan this year to direct a research project on the economy of Africa at the Center for International Studies, Massachusetts Institute of Technology.

Kenneth T. Strand, formerly of the University of Wisconsin, has been appointed acting instructor in economics at the State College of Washington.

Paul J. Strayer has been promoted to professor of economics at Princeton University.

Robert L. Strider has been appointed lecturer in accounting in the department of political economy, Johns Hopkins University.

Ronald L. Stucky has been appointed assistant dean of the newly created School of Industrial Management at Purdue University.

Daniel B. Suits has been given leave of absence from the University of Michigan to serve as director of the Seminar in American Studies at Kyoto in the summer and fall 1958.

Barry E. Supply has been named assistant professor of business administration in the Harvard Graduate School of Business Administration.

Joseph F. Talarico has been promoted to assistant professor of economics in the College of Arts and Sciences, Rutgers—The State University.

James Tang, formerly with the Bureau of the Census, is now an analytical statistician with the Bureau of Mines, Department of Interior, Washington, D.C.

Jack Taylor of the University of Rochester has accepted an appointment as associate professor of economics at the University of Buffalo. He is also lecturer in economics at the University of Rochester.

Overton H. Taylor of Harvard University is visiting scholar at the Thomas Jefferson Center for Studies in Political Economy at the University of Virginia in the first semester of this year.

Robert G. Taylor has been appointed instructor in accounting in the School of Business, University of Chicago.

Lester G. Telser has been appointed assistant professor of marketing in the School of Business, University of Chicago.

David W. Thompson has resigned from the School of Business, Indiana University.

James H. Thompson has been promoted to professor of economics in the College of Commerce, West Virginia University.

Philip H. Thurston has been named lecturer on business administration in the Harvard Graduate School of Business Administration.

Wendell P. Trumbull has been named head of the department of accounting at Lehigh University.

Lloyd Ulman of the University of Minnesota has been appointed professor of economics and industrial relations in the department of economics, University of California, Berkeley.

Melville J. Ulmer of The American University is a Fulbright professor for the year 1958-59 at the Netherlands School of Economics in Rotterdam.

Roger B. Ulvestad has been appointed acting assistant professor of marketing and transportation in the School of Business Administration, University of California, Los Angeles.

John H. Urban has been promoted to associate professor of economics at Lehigh University.

Richard F. Vancil is an instructor in business administration in the Harvard Graduate School of Business Administration.

Robert F. Vandell has been promoted to assistant professor of business administration in the Harvard Graduate School of Business Administration.

William J. Vatter has resigned from the School of Business, University of Chicago to become professor of accounting at the University of California, Berkeley.

William S. Vickrey has been promoted to professor of economics at Columbia University.

Dwight D. Vines has accepted an appointment as assistant professor of Northeast Louisiana State College.

Lloyd O. Wadleigh has resigned from Baldwin-Wallace College to become chairman of the department of economics at Carroll College, Waukesha, Wisconsin.

Martin Wagner, executive director of the Louisville, Ky. Labor-Management Committee, has been appointed director of the Institute of Labor and Industrial Relations at the University of Illinois.

Haskell P. Wald has been given a year's leave of absence from the Federal Reserve Bank of New York to accept a United Nations Technical Assistance appointment as economic adviser to the Bank of Greece in Athens.

Claude Walker has been appointed professor of management in the School of Business Administration, University of Miami.

Edward L. Wallace has resigned from the School of Business, University of Chicago, to become professor of accounting and business administration at the University of Buffalo.

Sherwood G. Walters has been promoted to associate professor of marketing at Lehigh University.

Richard J. Ward of Fordham University has taken a position with Caltex Oil Company, New York.

Harold W. Watts has been promoted to assistant professor of economics at Yale University.

Richard S. Weckstein has been appointed assistant visiting professor at the University of Rochester.

Emanuel T. Weiler has been appointed dean of the newly created School of Industrial Management at Purdue University.

Paul Weiner has been promoted to assistant professor of economics at Denison University.

W. Keith Weltmer has been promoted to a full professorship in the School of Business, University of Kansas.

Thomas Whisler has been promoted to associate professor of industrial relations in the School of Business, University of Chicago.

C. Arthur Williams, Jr. has been promoted to the rank of professor at the University of Minnesota.

Ernest W. Williams, Jr. has been promoted to professor of transportation in the Graduate School of Business, Columbia University.

Frederick Williams has resigned from the University of Illinois to accept an appointment as associate professor at the University of Missouri.

J. Earl Williams has been appointed assistant professor of economics in the College of Business Administration, The University of Tennessee.

James R. Williams has been appointed instructor in economics at the University of Minnesota.

David M. Winch has been appointed special lecturer in economics at the University of Saskatchewan for the current academic year.

Ronald H. Wolf has been appointed assistant professor of economics in the College of Business Administration, The University of Tennessee.

Paul Wolotkin has been appointed assistant professor in the department of commerce and economics, University of Vermont.

Paul Wonnacott of Princeton University has been appointed instructor in economics at Columbia University.

C. Dow Worley of Baylor University has been named assistant professor of management at Los Angeles State College.

Shih-Yen Wu has been appointed visiting lecturer in economics at the University of Minnesota.

John H. Young has been promoted to associate professor of economics at Yale University.

## FIFTY-FIFTH LIST OF DOCTORAL DISSERTATIONS IN POLITICAL ECONOMY IN AMERICAN UNIVERSITIES AND COLLEGES

The present list specifies doctoral degrees conferred during the academic year terminating June 1958, and theses undertaken in the same period.

### General Economics; Methodology

#### *Degrees Conferred*

- JAMES F. BECKER, Ph.D. Columbia 1957. On the explanation concept in economics.  
JOHN A. DAVIS, Ph.D. Alabama 1957. Ethics, economics and individualism.  
JAMES B. QUINN, Ph.D. Columbia 1958. The measurement and evaluation of research results.  
LESLIE P. SINGER, Ph.D. Indiana 1958. Aspects of the theory of normative economics.

#### *Theses in Preparation*

- REV. F. J. BUCKLEY, B.A. Holy Cross 1941; M.S.S.W. Boston College 1950. A study of the economic concepts and attitudes of seminarians of the Boston Archdiocesan Seminary and of some economic factors in their backgrounds. *Boston College*.

### Price and Allocation Theory; Income and Employment Theory; Related Empirical Studies; History of Economic Thought

#### *Degrees Conferred*

- OWEN F. ALDIS, Ph.D. Harvard 1958. The basis of welfare economics.  
VINCENT F. BOLAND, Ph.D. California (Los Angeles) 1958. Pigou's optimum conditions for production and exchange.  
MEYER L. BURSTEIN, Ph.D. Chicago 1957. The demand for household refrigeration in the United States.  
ARNOLD P. COLLERY, Ph.D. Princeton 1958. Some theoretical implications of the wealth-saving relationship.  
JOHN L. CORNWALL, Ph.D. Harvard 1958. Economic implications of some dynamic models.  
JOHN P. DOLL, Ph.D. Iowa (Ames) 1958. Evaluation of alternative algebraic forms for production functions.  
JACQUES DREZE, Ph.D. Columbia 1958. Individual decision making under partially controllable uncertainty.  
TIBOR FABIAN, Ph.D. California (Los Angeles) 1957. Process analysis of the U.S. iron and steel industry; a linear programming model.  
ABRAHAM C. FLORA, JR., Ph.D. North Carolina 1958. Economic thought in South Carolina—1820-1860.  
JAMES A. GHERITY, Ph.D. Illinois 1958. Alfred Marshall and economic development.  
ARTHUR S. GOLDBERGER, Ph.D. Michigan 1958. Properties of an econometric model of the United States.  
CRAUFORD D. W. GOODWIN, Ph.D. Duke 1958. Canadian economic thought, 1814-1914.  
YEHUDA GRUNFELD, Ph.D. Chicago 1958. Determinants of corporate investment.  
ABRAHAM HIRSCH, Ph.D. Columbia 1957. Reconstruction in economics: the work of Wesley Clair Mitchell.

- AUSTIN C. HOGGATT, Ph.D. Minnesota 1957. Simulation of the firm.
- ROBERT C. JONES, Ph.D. Pennsylvania 1958. Income expectations and consumer spending.
- FRANCIS T. JUSTER, Ph.D. Columbia 1957. Analysis of the saving function with special reference to the role of consumer durable goods.
- ANNA L. KRUEGER, Ph.D. Wisconsin 1958. An evaluation of some growth theories in light of United States economic experience 1946-47.
- DUDLEY G. LUCKETT, Ph.D. Texas 1958. A theoretic and historical study of the term structure of interest rates.
- JOHN MONTIAS, Ph.D. Columbia 1958. Prices of producers' goods in post-war Poland.
- RICHARD F. MUTH, Ph.D., Chicago 1958. The demand for non-farm housing.
- DON V. PLANTZ, Ph.D. Indiana 1957. A reappraisal of Cournot's *Recherches* and its influence upon the development of economic thought.
- KYOHEI SASAKI, Ph.D. Columbia 1958. A western influence on Japanese economic thought: the Marxian non-Marxian controversies of the 1920's and their significance for today.
- HARRY G. SHAFFER, Ph.D. New York 1958. The economic functions of government in early English classical economic thought.
- STANLEY W. STEINKAMP, Ph.D. Michigan 1958. Some factors which influence investment decisions.
- HERMANN STOLLER, Ph.D. Virginia 1958. The very short run in economic theory.
- ROBERT M. WILL, Ph.D. Duke 1958. Some aspects of the development of economic thought in Chile (ca. 1778-1878).
- FREDERICK WILLIAMS, Ph.D. Northwestern 1958. A statistical analysis of the demand for industrial molasses.

### *Theses in Preparation*

- K. JANAKI KUTTY AMMA, B.A., Univ. of Travancore 1944; M.A. 1946; M.A. Fletcher School 1957. United Nations technical assistance: a study in decision-making for allocation of resources. *Fletcher School*.
- RALPH ANSPACH, B.A. Chicago 1948; Dipl. Univ. of Paris 1951. The economics of growth of Sismondi. *California (Berkeley)*.
- LEO I. BAKONY, B.A. British Columbia 1944. A quarterly econometric model of the Canadian economy. *Washington*.
- HAROLD F. BREIMYER, B.S. Ohio State 1934; M.S. 1935. Analysis of factors affecting the determination of prices of meat and meat animals, in both the short and long run. *American*.
- IRENE H. BUTTER, B.A. Queens 1953; M.A. Duke 1955. Some aspects of Dutch economic thought during the nineteenth century. *Duke*.
- NAI-RUENN CHEN, B.A. National Taiwan 1950; M.S. Illinois 1955. Factors influencing investment expenditures. *Illinois*.
- EDWIN K. CLICKNER, B.S. American 1948; M.A. 1955. The proletarian development in classical economic theory (1775-1874). *American*.
- KALMAN COHEN, B.A. Reed 1951; B.Litt. Oxford 1953; M.S. Carnegie Inst. Technology 1956. A computer model of the shoe, leather, and hide industries. *Carnegie Inst. Technology*.
- PIERRE R. CROSSON, B.A. Texas 1948. Gross savings, growth models and stagnation. *Columbia*.
- PETER DANNER, B.A. St. Louis 1945; M.A. 1949. Inquiry into the origins of Adam Smith's theory of value. *Syracuse*.
- LOUIS A. FOURT, B.A. Missouri 1939. Empirical income elasticities for food and its component values produced by farmers, manufacturers and other marketing agencies in the United States, 1929-1956. *Chicago*.

- FRED M. GOTTHEIL, B.A. McGill 1954; M.A. Duke 1957. Economic predictions of Karl Marx. *Duke*.
- MARK A. HASKELL, B.S. Rutgers 1949; M.S. Cornell 1950. David Ricardo: An investigation of J. H. Hollander's uncompleted manuscript. *Rutgers*.
- EDGAR P. HICKMAN, B.A. North Carolina 1954. A regional income growth model. *North Carolina*.
- ALBERT A. HIRSCH, B.A. Oberlin 1955; M.A. Duke 1958. A classification of real Keynesian models on the basis of their fundamental assumptions. *Duke*.
- T. EDWARD HOLLANDER, B.S. New York 1952; M.B.A. 1953. Economic significance of measures of capital formation and capital consumption in the business factor of the economy. *Pittsburgh*.
- CHARLES W. HOWE, B.A. Rice 1952. Corporate savings behavior. *Stanford*.
- HARRY L. JOHNSON, B.A. Emory and Henry 1952; M.A. Virginia 1957. Price behavior and product differentiation. *Virginia*.
- TOSHINOSUKE KASHIWAZAKI, B.A. Waseda (Tokyo) 1951; M.E., 1953. A critical study of recent contributions to the theory of welfare economics. *North Carolina*.
- SISTER MARTHA JULIE KEEHAN, S.N.D., B.A. Trinity 1951; M.A. Catholic 1953. An analysis of the content and influence of the economic writings of George Tucker. *Catholic*.
- SUSUMU KOIZUMI, B.A. Osake 1953; M.A. Michigan 1956. Econometric models in the U.S. with simple industrial relations. *Michigan*.
- MICHAEL C. LOVELL, B.A. Reed 1952; M.A. Stanford 1954. Manufacturers' inventories. *Harvard*.
- WILL LYONS, B.S. Bucknell 1939; M.A. Harvard 1955. The balanced-budget multiplier. *Harvard*.
- ALBERT A. MONTGOMERY, B.S.C. Iowa 1953; M.A. 1955. A critical analysis of the balance sheet approach to the theory of the firm. *Iowa*.
- AMOS M. MOORE, B.A. Howard 1949; M.S. Alabama Polytechnic Inst. 1957. The use of Engel curves as welfare indicators. *North Carolina*.
- FREDERICK C. SCHADRACK, B.A. Buffalo 1952; M.A. California (Berkeley) 1954. The determinants of expenditures on commercial construction in the United States, 1920-1955. *California (Berkeley)*.
- KARL A. SCHELD, B.S.C. Iowa 1952; M.A. 1954. Evaluation of the concept of the economic base. *Iowa*.
- FRANKLIN R. SHUPP, B.S. Lafayette 1954; M.A. Princeton 1957. Programming and games as a guide for national problems. *Princeton*.
- DAVID H. STERN, B.A. California 1955. Operational gaming and economics. *Princeton*.
- ERMIS A. THOMPSON, B.S. Florence State Teachers 1949; M.A. Alabama 1952. A study of recent economic theories of profit. *Alabama*.
- JOHN W. L. WINDER, B.Comm. Toronto 1954; M.A. 1955. The supply of stocks—copper. *Chicago*.

### Economic History; Economic Development; National Economies *Degrees Conferred*

- ALEC P. ALEXANDER, Ph.D. California (Berkeley) 1957. Economic change in Turkey, 1948-1955.
- JOSEPH AMRHEIN, Ph.D. New York 1958. Burlington, Vermont: The economic history of a northern New England City.
- RUBEN V. AUSTIN, Ph.D. Iowa 1958. The development of economic policy in Mexico with special reference to economic doctrines.
- RUBAN C. BELLAN, Ph.D. Columbia 1958. The development of Winnipeg as a metropolitan centre.

- JAMES J. BERNA, S.J., Ph.D. Columbia 1958. Entrepreneurship in Madras Province, India.
- JAMES H. BLACKMAN, Ph.D. Columbia 1958. Soviet transport and the process of industrialization.
- WILLIAM B. BURKE, Ph.D. Georgetown 1958. The role of the entrepreneur in Japanese economic development.
- DAVID E. CARNEY, Ph.D. Pennsylvania 1958. Public agencies and economic development in British West Africa—1947-1955.
- HAROLD O. CARTER, Ph.D. Iowa (Ames) 1958. Regional input-output analysis of agriculture and industry.
- PENG CHANG, Ph.D. Washington 1957. The distribution and relative strength of the provincial merchant groups in China, 1842-1911.
- K. J. CHARLES, Ph.D. McGill 1958. A study in economic history and theory.
- RIBHI ABU EL-HAJ, Ph.D. Columbia 1957. Oil industry; a strategic factor in the economic development of Iraq.
- KAMEL ABBAS EL-HALAWANI, Ph.D. Pennsylvania 1958. State and industry in Egypt. 1818-1952.
- THEO H. ELLIS, Ph.D. Florida 1957. Optimum programs in Columbia and Suwannee counties, Florida.
- MARGERY J. FOSTER, Ph.D. Radcliffe 1958. The economic history of Harvard College in the Puritan period (1635 to 1712).
- ANDREW G. FRANK, Ph.D. Chicago 1957. Growth and productivity in Ukrainian agriculture and industry, 1928 to 1955.
- FAWZI HABIB, Ph.D. Duke 1958. The course and problems of an export economy: the case of El Salvador.
- CHARLES HAMMOND, JR., Ph.D. Illinois 1958. Factors affecting economic growth in France, 1913-1938.
- MAHBUB UL HAQ, Ph.D. Yale 1958. Planned capital formation in an underdeveloped economy: the case of Pakistan.
- MOSTAFA FATHY HASSAN, Ph.D. Wisconsin 1957. The role of the government in the economic development of Egypt.
- EBENEZER OGUGUA IWUAGWU, Ph.D. Wisconsin 1957. Capital formation in Nigeria: some financial and economic implications.
- KENNETH M. KAUFFMAN, Ph.D. Harvard 1958. Some nineteenth century contributions to the study of economic development.
- HERBERT KISCHE, Ph.D. Washington 1958. The crafts and their role in the industrial revolution: the case of the German textile industry.
- DUNCAN M. McDOUGALL, Ph.D. Johns Hopkins 1958. The economic growth of Canada and the United States, 1870-1955: a quantitative analysis of selected aspects.
- RUSSELL U. McLAUGHLIN, Ph.D. Pennsylvania 1958. The economic development of Liberia between 1940 and 1955: a study of the role of the United States public and private investment in economic development.
- ORLANDO J. MENEZES, Ph.D. Princeton 1958. Agricultural stagnation as an obstacle to industrial growth in India, 1920-1950.
- OM PRAKASH NIJHAWAN, Ph.D. Nebraska 1957. Economic development and India's five-year plans.
- BEN U. NZERIBE, Ph.D. Cornell 1958. The economic development of Eastern Nigeria.
- RAYMOND F. PELISSIER, Ph.D. American 1958. The contribution of certain American business firms to the economic development of Mexico since World War II.
- JOHN E. PERKINS, Ph.D. Texas 1958. Theories of economic development considered in relation to agricultural growth.

- A. DAVID REDDING, Ph.D. Columbia 1958. Nonagricultural employment in the USSR, 1928-1955.
- HARVEY H. SEGAL, Ph.D. Columbia 1956. Canal cycles, 1834-61. Public construction experience in New York, Pennsylvania and Ohio.
- GEORGE A. SPIVA, JR., Ph.D. Texas 1958. Economic development in modern Greece: a study of institutional resistances.
- NORMAN W. TAYLOR, Ph.D. Yale 1958. Entrepreneurship in French Canada.
- RAPHAEL DE J. TORO, Ph.D. Syracuse 1957. Inducing entrepreneurship in underdeveloped countries.
- ALI ASGHAR VAHABZADEH, Ph.D. Southern California 1956. Conceptual problems in the inter-industry analysis and linear projection techniques as a tool of national planning in underdeveloped countries.
- C. C. VELAY, Ph.D. McGill 1957. Some aspects of the problems of economic development in underdeveloped countries.
- FRANKLIN V. WALKER, Ph.D. Harvard 1958. An estimate of growth in the Texas Louisiana Gulf Coast area.
- WILLIAM WOLMAN, Ph.D. Stanford 1958. The development of manufacturing industry in the State of Washington, 1899-1947.
- MANUEL ZYMELMAN, Ph.D. Mass. Inst. Technology 1958. Economic history of Argentina (1933-1952).

### *Theses in Preparation*

- CECIL ALTMANN, B.A. Harvard 1955; M.A. 1957. The recovery of Austria, 1945-1955. *Harvard*.
- LAWRENCE W. BARSS, B.A. Princeton 1950. Political development and economic growth. *Mass. Inst. Technology*.
- ELLIOT J. BERG, B.A. New York 1949; M.A. Columbia 1955; M.A. Harvard 1957. Development of tropical Africa. *Harvard*.
- H. T. BOLAND, JR., B.A. U.S. Military Academy 1949; M.A. Columbia 1956. Developmental effects of United States military assistance in selected countries. *Columbia*.
- ROBERT T. BROWN, B.A. Wesleyan 1955; M.A. Harvard 1957. Criteria for determining the allocation of capital in transportation. *Harvard*.
- NANDA KUMAR CHOUDHRY, B.A. Patna (India) 1948; M.S. Wisconsin 1951. Deficit financing and its effects on the economy with special reference to underdeveloped areas. *Wisconsin*.
- MICHAEL J. COONEY, B.A. Columbia 1948; M.A. 1950. Motives for individual savings in Puerto Rico. *Columbia*.
- ALBIN J. DAHL, B.A. California (Berkeley) 1948; M.A. 1953. The role of British investment in the economic development of California. *California (Berkeley)*.
- MANUEL O. DIAZ, B.A. Univ. Puerto Rico 1942; M.A. Clark 1943. The Spanish average principle as practiced in the trade between Spain and the Indies. *Pennsylvania*.
- FRED DURR, M.A. Univ. Miami 1955. Regional development and commodity flows. *Kansas*.
- EDWARD G. EMERLING, B.B.A. St. Bonaventure 1951; M.A. Catholic 1953. Community efforts at promoting economic development in the New England area. *Catholic*.
- THOMAS O. ENDERS, B.A. Yale 1953; M.A. Harvard 1957. Capital and colonization. *Harvard*.
- MARION FORRESTER, B.S. New York 1945. Capital accumulation in Kenya. *Bryn Mawr*.
- ROBERT M. GELMAN, B.A. New York 1942; M.A. Catholic 1956. Economic development of the western frontier under a planned and a free economy: U.S.S.R. and Canada. *Catholic*.
- GINO GIUSTI, B.S. Pittsburgh 1949; M.S. 1953. An economic study of research and development expenditures in American industry. *Pittsburgh*.

- GEOFFREY B. HAINSWORTH, B.S. London School of Economics 1955. Theory and practice of colonial economic development. *California (Berkeley)*.
- JOHANNES HIRSCHMEIER, B.A. St. Augustine Seminary 1951; M.A. Harvard 1957. Time horizon on the Japanese entrepreneurs. *Harvard*.
- WILLIAM C. HOEKENDORF, B.A. Washington 1944; M.A. 1952. The money supply in Japan during the Meiji era. *Washington*.
- IRA HOROWITZ, B.A. Johns Hopkins 1955. Industrial research in the United States. *Mass. Inst. Technology*.
- MOHAMMED H. JAFRI, B.A. Allahabad (India) 1949; LL.B. 1951; M.A. California (Berkeley) 1955. Economic planning in Pakistan. *California (Berkeley)*.
- PHIMOL JITTEMANA, LL.B. Thammasant (Thailand) 1952. Agriculture in a developing economy of Thailand—A mid-century appraisal. *Wisconsin*.
- MARVIN E. LEE, B.A. California 1950. The economic development of the Southeastern United States. *North Carolina*.
- BETTY R. McLEOD, B.A. McMasters 1945; M.A. Duke 1948. A history of immigration, settlement and economic development of Canada, 1600-1957. *Duke*.
- RAMON H. MYERS, B.A. Washington 1954; M.A. 1956. Economic development of Manchuria under the Japanese—1932-1945. *Washington*.
- HANEEF AHMED NASEEM, B.A. Punjab 1945; M.A. Delhi 1951. Progress of economic growth in Pakistan (1947-1957)—A critical study in retrospect. *American*.
- I. D. PAL, M.A. Univ. Panjab 1948; M.Sc. London Univ. 1952. Commercial policy and economic development with reference to Pakistan. *McGill*.
- SAMUEL PAUL, B.A. Madras Christian College 1950. Investment criteria in the first and second five year plans in India. *Syracuse*.
- RICHARD L. PFISTER, B.A. Kansas 1948; M.A. 1950. The commodity balance of trade of the Pacific Northwest. *Mass. Inst. Technology*.
- WARNASENA SASAPUTRAM, B.A. Ceylon 1950; M.A. Wisconsin 1957. National income and foreign trade of Ceylon—A structural analysis. *Wisconsin*.
- BEATRICE G. REUBENS, B.A. Brooklyn College 1937; M.A. Columbia 1938. The state and private enterprise in the economic development of early New York. *Columbia*.
- JULIUS RUBIN, B.A. Brooklyn College 1949; M.A. Columbia 1955. Imitation by canal or innovation by railroad: a comparative study of the response to the Erie Canal in Boston, Philadelphia, and Baltimore. *Columbia*.
- JOGINDER SAHOTA, B.S. Oregon State 1952; M.A. 1954. A study of the interaction between productivity and the process of capital formation in the agricultural sector of the Indian economy. *Oregon*.
- S. A. SHAH, B.Sc. Oregon State 1952; M.Sc. 1953. Structural obstacles to economic development in underdeveloped countries—India—a case study. *McGill*.
- DONALD SOLAR, B.A. Wisconsin 1951. Techniques of planning economic development. *Columbia*.
- SHANTI S. TANGRI, B.Sc. Univ. Panjab 1947; M.A. 1949. Patterns of investment and rates of growth, with special reference to India. *California (Berkeley)*.
- GEORGE VARGHESE, M.S. Univ. College, Trivandrum, India, 1948. Technology and economic development. *New School for Social Research*.
- HAZEL J. WALDROP, B.A. Montana State 1951; M.A. Southern California 1953. Theories of economic decline. *Southern California*.
- ELIEZER ZVITEL, M.A. Israel Univ. 1954. Thailand's trade—patterns, objectives, and policies. *Cornell*.

**Statistical Methods; Econometrics; Social Accounting***Degrees Conferred*

- JOHN A. BRITTAI, Ph.D. California (Berkeley) 1958. The size distribution of income in the United Kingdom since the mid-thirties.
- WILFRED V. CANDLER, Ph.D. Iowa (Ames) 1957. Linear programming with stochastic yields.
- JACOB MINCER, Ph.D. Columbia 1957. A study of personal income distribution.
- ALFRED P. THORNE, Ph.D. Columbia 1958. The Jamaican economy: portrayal and analysis by sector and national accounts.

*Theses in Preparation*

- MOHAMMED A. Y. AL-AKEL, Dipl. Syrian Univ. 1951; M.S. Columbia 1956. National income accounts for Syria. *Columbia*.
- ROBERT A. BANDEEN, B.A. Western Ontario 1952. State per capita automobile expenditures and income, 1930, 1940, and 1950. *Duke*.
- WILLARD L. EASTMAN, B.A. Cornell 1953; M.A. Harvard 1955. The solution of programming problems containing pattern constraints. *Harvard*.
- FRANKLIN M. FISHER, B.A. Harvard 1956; M.A. 1957. Selective estimation: A priori information and the analysis of time series. *Harvard*.
- SEYMOUR GOODMAN, B.B.A. City (New York) 1954; M.A. Brown 1956. Income inequality in states and regions. *Johns Hopkins*.
- FRANCIS X. HAMMETT, B.A. Catholic 1953; M.A. 1957. History of American statistics, 1900-1935. *Catholic*.
- JAMES E. HOLSTEIN, B.A. Iowa 1952; M.A. 1955. Variable exponent production functions for manufacturing. *Iowa*.
- WILLIAM J. HORNE, B.S. Boston College 1951; M.A. 1953. The economic aspects of electronic computers. *Boston College*.

**Economic Systems; Planning and Reform; Cooperation***Degrees Conferred*

- RONALD G. RIDKER, Ph.D. Wisconsin 1958. National budgeting in Norway: a study in economic policy formation.
- CHARLES J. TOBIN, Ph.D. Georgetown 1957. A theory of socio-economic organization: the economics of profit sharing.
- J. HART WALTERS, JR., Ph.D. Pennsylvania 1958. The distribution of chemical fertilizers in India: a case study of the compatibility of privately-planned market distribution with public economic planning in India.

*Theses in Preparation*

- WALTER G. MELLON, B.A. Virginia 1953; M.A. Princeton 1956. Some problems and methods in the assignment of economic priority indicators in the absence of an effective price situation. *Princeton*.

**Business Fluctuations***Degrees Conferred*

- MEREDITH O. CLEMENT, Ph.D. California (Berkeley) 1958. The efficacy of automatic stabilizers.
- MORRIS COHEN, Ph.D. Harvard 1958. Forecasting consumer and business behavior.
- JOHN S. DE CANT, Ph.D. Pennsylvania 1958. Planned investment as an economic predictor.

- GERALD GARR, Ph.D. California (Berkeley) 1957. Postwar inflation in Sweden, 1945-1953.
- ALBERT L. GRAY, JR., Ph.D. Pennsylvania 1958. Secular movements and cycles in financial contributions to ten selected Protestant denominations, 1900 to 1954.
- MILLARD HASTAY, Ph.D. Columbia 1958. The formation of business expectations about operating variables.
- DAVID T. LARKIN, Ph.D. Columbia 1957. Building construction and building cycles.
- SEYMOUR H. MILLER, Ph.D. Columbia 1957. Inflation in France, 1939-1952.
- HOWARD E. MITCHELL, Ph.D. Washington 1958. The Employment Act of 1946 and the economic role of government: trends in economic thinking and prescription.
- BURKE A. PARSONS, Ph.D. Texas 1958. British trade cycles and American bank credit.
- HENRY M. PLATT, Ph.D. Columbia 1957. Short-run forecasting.
- NEWTON Y. ROBINSON, Ph.D. Columbia 1958. The acceleration principle: department store inventories, 1920-1956.
- MURRAY N. ROTHEBARD, Ph.D. Columbia 1957. The panic of 1819: contemporary opinions and policy.
- NORBERT D. WARREN, Ph.D. Columbia 1957. Forecasting inventory changes in the private sector of the American economy.

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- PETER EILBOTT, B.A. Columbia 1953; M.A. 1956. A study of automatic stabilizers. *Columbia*.
- DAVID E. NOVACK, B.A. New York 1952; M.A. Columbia 1957. Economic fluctuations in the United States, 1903-1910. *Columbia*.
- ALAN A. SPIRO, B.A. Brooklyn College 1953. The business cycle and the rate of interest. *Columbia*.
- HERMAN STEKLER, B.A. Clark 1955. Essays in economic forecasting. *Mass. Inst. Technology*.

### **Money, Credit and Banking; Monetary Policy; Consumer Finance; Mortgage Credit**

#### *Degrees Conferred*

- JAMES B. BOULDEN, D.B.A. Indiana 1958. The organization structure of commercial banks.
- DONALD C. BRIDENSTINE, Ph.D. Southern California 1957. Commercial banking in Arizona —past and present.
- JOHN T. BURKE, Ph.D. Michigan State 1958. Commercial bank treatment of bad debt losses, its relationship to the economic and accounting concepts of income measurement, and the effects of the federal income tax requirements.
- CONO CASELLA, Ph.D. New York 1958. The reorganization of the Italian investment banking system: 1922-1936.
- EDWARD COOK, Ph.D. Fordham 1958. Commercial bank failures in New York State 1930 to 1940.
- RAY E. DAWSON, Ph.D. Northwestern 1957. Monetary policy and sales finance and small loan companies' funds, 1949-1954.
- FAWZI ABDULLA EL KAISSE, Ph.D. Southern California 1957. Critical analysis of central banking in Iraq.
- OSCAR R. FLYNN, Ph.D. Columbia 1958. The positive aspect of bank capital.
- PETER FOUSEK, Ph.D. Columbia 1957. Foreign central banking: the instruments of monetary policy.
- WILLIAM C. FREDERICK, Ph.D. Texas 1958. Introduction to a cultural theory of money.
- THOMAS J. GARDNER, Ph.D. New York 1958. Problems in the development of financial institutions among Negroes, current trends and the future in business.

- ROBERT E. HARRIS, Ph.D. Pennsylvania 1958. Federal margin requirements: a selective instrument of monetary policy.
- ROBERT E. HILL, Ph.D. Alabama 1957. The growth and development of foreign banking in three commercial banks in Mobile, Alabama.
- PAUL M. HORVITZ, Ph.D. Mass. Inst. Technology 1958. Concentration and competition in New England banking.
- BYONG KUK KIM, Ph.D. Wisconsin 1957. Central banking in a dependent economy with a special reference to Ceylon.
- IRVING O. LINGER, Ph.D. Texas 1958. The role of clearing under the Federal Reserve System.
- GEORGE MACESICH, Ph.D. Chicago 1958. Monetary disturbances in the United States 1834-45.
- HARRY D. MALONEY, Ph.D. Indiana 1958. Monetary policy and the recession of 1953-54.
- ADNAN J. MARDINI, Ph.D. American 1958. Monetary policy for economic development; a case study: Syria during the last decade.
- ALLAN H. MELTZER, Ph.D. California (Los Angeles) 1957. Determinants, empirical tests and some implications of the money supply function: France 1938-1954.
- ROGER F. MILLER, Ph.D. California (Berkeley) 1958. A monetary model.
- JERRY MINER, Ph.D. Michigan 1958. Consumer personal debt: an intertemporal cross-section analysis.
- PAUL S. NADLER, Ph.D. New York 1958. Federal Reserve policy since the March, 1951 accord.
- EON NEUBERGER, Ph.D. Harvard 1958. Central banking in semi-planned economies—Yugoslav case.
- ROBERT H. PARKS, Ph.D. Pennsylvania 1958. Portfolio operations of commercial banks in the U.S. Treasury securities market.
- ROBERT W. PEASE, Ph.D. New York 1957. Background for currency control.
- HUBERT F. SCHIFFER, S.J., Ph.D. Fordham 1958. The modern Japanese banking system.
- S. C. SCHMIDT, Ph.D. McGill 1958. Models of cyclical fluctuations in farm mortgage credit.
- LAWRENCE L. WERBOFF, Ph.D. Stanford 1958. Consumer installment credit terms, consumer behavior, and monetary policy.

### *Theses in Preparation*

- YOSSEF ATTIEYEH, B.A. Hebrew Univ. 1952; M.A. 1956. Wage-price spiral inflation versus demand inflation. *Chicago*.
- ANATOL BALBACH, B.A. California (Los Angeles) 1951; M.A. 1952. Money supply and the price level: U.S. experience. *California (Los Angeles)*.
- IRWIN I. BASKIND, B.B.A. City (New York) 1948. Post-war monetary policy in Belgium. *Chicago*.
- WILLIAM R. BELMONT, B.A. DePaul Univ. 1952; M.A. George Washington 1954. Cost-price relationships and inflationary pressures. *George Washington*.
- GORDON F. BOREHAM, B. Comm. Ottawa 1952; M.A. 1955. Significant changes in the monetary structure of Canada, 1953-58. *Columbia*.
- DAVID CHAMBERS, B.A. Oxford 1953; M.A. Cornell 1954; M.S. Carnegie Inst. Technology. Differential effects of credit restriction in periods of high activity. *Carnegie Inst. Technology*.
- KENNETH D. COURTNEY, B.A. Washington 1951; M.B.A. 1954. The intermediate-term financing of small retail business enterprises. *Ohio State*.
- THEODORE R. ECK, B.A. Michigan State 1952; M.A. Michigan 1953. Comparative liquid saving flows. *Michigan State*.
- RACHEL FLOERSHEIM, M.A. Hebrew Univ. 1953. Financial intermediaries in Israel, 1950-1954. *Johns Hopkins*.

- LOUISE FREEMAN, B.A. Wellesley 1954; M.A. Columbia 1957. Non-bank financial intermediaries and monetary policy. *Columbia*.
- J. A. GALBRAITH, B. Comm. McGill 1948; M. Comm. 1951. A study of the Canadian banking system. *McGill*.
- HARRY P. GUENTHER, B.A. Dartmouth 1955; M.B.A. Amos Tuck 1956. The effects of restrictive monetary policy on the loan and investment policies of commercial banks and life insurance companies: A case study in the St. Louis and Chicago Federal Reserve districts. *Indiana*.
- HARMON H. HAYMES, B.A. Lynchburg 1954; M.A. Virginia 1956. Relative effects of quantitative credit controls. *Virginia*.
- CHARLES S. HOLLOWAY, B.A. Lincoln (Missouri) 1940; M.A. Catholic 1942. Certain aspects of the development of banking in British West Indies. *Catholic*.
- EDWARD J. KILBERG, B.A. Hofstra 1949; M.A. Duke 1952. Commercial bank asset holdings and the liquidity trap. *Chicago*.
- ERNEST KOHN, B.B.A. City (New York) 1946; M.A. Columbia 1951. New York City's relative position as a commercial banking center, 1896-1957. *Columbia*.
- JOHN R. KREIDLE, B.S. Grove City College 1951; M.B.A. Miami Univ. 1952. Theories of inflation and consumer instalment credit. *Ohio State*.
- BASIL J. MOORE, B.A. Toronto 1955. The effects of monetary policy upon the financial position of Canadian chartered banks, 1935-1957. *Johns Hopkins*.
- HUGH T. PATRICK, B.A. Yale 1951; M.A. Michigan 1955. Credit policy of the Bank of Japan since 1949. *Michigan*.
- JOHN C. G. PERET, B.S. Missouri 1947; M.A. 1950; M.A. Harvard 1954. Some effects of changes in the rate of interest on the share of interest income in national income. *Harvard*.
- IRA J. RAPSON, JR., B.A. Michigan 1951; M.A. 1952. Consumer credit and the small claims court in Madison. *Wisconsin*.
- GUNTER RISCHER, B.A. Free University, Berlin, 1954; M.A. Harvard 1957. The impact of institutional investors on the stock market. *Harvard*.
- KARL W. ROSKAMP, B.A. Frankfurt 1956; M.A. Michigan 1955. Monetary policy in Western Germany. *Michigan*.
- DONALD H. SAUER, B.S. Indiana 1954; M.B.A. 1955. The supply of and demand for mortgage funds 1960-1970. *Indiana*.
- ARTHUR T. TAITT, B.S., B.A. Denver 1948; M.B.A. 1949. Case studies and executive development programs in commercial banking since 1946. *Indiana*.
- ROBERT J. TRUSK, B.S. St. Ambrose 1951; M.S. Columbia 1954. Money and banking in the Ottoman Empire in the 19th century. *Illinois*.
- W. OKEFIE UZOAGA, M.A. Cornell 1953. The monetary and banking system of Nigeria. *Fordham*.
- LEONARD P. VIDGER, B.A. Seattle Pacific 1948; M.S. Southern California 1954. The Federal National Mortgage Association. (General background, appraisal and devaluation of this institution.) *Washington*.
- LEROY S. WEHRLE, B.A. Washington (St. Louis) 1953. A study of institutional demand for securities. *Yale*.
- GORDON P. WONNACOTT, B.A. Western Ontario 1955; M.A. Princeton 1957. Canadian monetary policy since 1950. *Princeton*.

### Public Finance; Fiscal Policy

#### Degrees Conferred

- GEORGE BABILOT, Ph.D. Oregon 1958. An analysis of direct and indirect taxation: a re-ordering of some basic concepts in tax theory.

- JOHN C. BOWEN, Ph. D. Michigan 1958. Some aspects of transfer taxation in the United States.
- LESLIE CARRERT, Ph.D. Columbia 1958. The impact of state and local taxes in North Carolina and the southeastern states.
- SIDNEY J. CLAUNCH, Ph.D. Wisconsin 1958. Urban decentralization, suburbanism and fiscal equity.
- LEO COHEN, Ph.D. California (Los Angeles) 1958. A measurement and analysis of the built-in flexibility of the individual income tax.
- ROBERT L. DARCY, Ph.D. Colorado 1957. Local income taxation: City of Denver as a case study.
- NORMAN DRESSEL, Ph.D. New York 1958. Budgeting in the public economy: lessons of the TVA experience.
- REED R. DURTSCHI, Ph.D. Washington 1957. Life insurance companies under the federal income tax.
- TARIQ EL-MUTWALLI, Ph.D. American 1958. The tax system of Iraq: a study of taxation in a developing country.
- LOUIS FIER, Ph.D. New York 1958. The fiscal economics of state bonuses for veterans.
- HENRY J. FRANK, Ph.D. Columbia 1958. The New Jersey property tax—substitute for state aid?
- GEORGE HANC, Ph.D. Columbia 1958. United States savings bonds and federal debt management.
- HARVEY I. HENANN, Ph.D. New York 1958. Commodity taxes and stabilization policy.
- JAMES W. JOHNSTON, Ph.D. Indiana 1958. Succession duties in Canada.
- BONG HYOK KAY, Ph.D. Wisconsin 1958. Fiscal and taxation policy in a developing economy with special reference to the Republic of Korea.
- SIDAGOUDA KHOT, Ph.D. Illinois 1958. Development of tax ideas in India.
- LEON E. KRAUSE, Ph.D. New York 1958. Management of the federal debt.
- SANG SOO KWAK, Ph.D. Wisconsin 1958. Selective consumption taxes.
- MICHAEL E. LEVY, Ph.D. Columbia 1958. The effect of personal exemptions on the income tax structure.
- HUGH H. MACAULEY, JR., Ph.D. Columbia 1957. Taxation of fringe benefits.
- JACKSON R. E. PHILLIPS, Ph.D. Columbia 1957. New York City—New York State fiscal relations.
- DONALD E. ROARK, D.B.A. Indiana 1958. The impact of the federal income tax on residential real estate developers.
- CHING SHENG SHEN, Ph.D. North Carolina 1957. Theory of built-in flexibility: a study of the built-in flexibility of the North Carolina individual income tax and the prediction of North Carolina individual income tax yield.
- WILLIAM M. SHENKEL, Ph.D. Washington 1957. An evaluation of assessment ratio studies in selected states.
- JARED SPARKS, JR., Ph.D. Illinois 1958. Deflationary aspects of excise taxes in Canada.
- RICHARD E. SPEAGLE, Ph.D. Princeton 1958. Comparative public debt management: Canada and the United States, 1939-1946.
- WILLIAM F. TAUCHAR, Ph.D. California (Berkeley) 1958. San Francisco: a study in local finance.
- WILLIAM J. THOMAS, Ph.D. Michigan State 1957. Revenue bond financing.
- WILLIAM A. VOGELY, Ph.D. Princeton 1958. A case study in the measurement of government output.
- MURRAY L. WEIDENBAUM, Ph.D. Princeton 1958. Government spending: process and measurement.
- PAUL J. WELLS, Ph.D. Stanford 1958. A theoretical analysis of excise tax incidence.

*Theses in Preparation*

- JOSEPH M. BONIN, B.S. Spring Hill College 1950; M.A. Louisiana State 1952. Critical analysis of the state debt structure and debt management in Louisiana. *Louisiana State*.
- GERALD BOYLE, B.A. Colorado College 1951; M.A. New Mexico 1952. Service charges as a source of public revenue. *Syracuse*.
- ARLAND CHARLTON, B.A. Northeastern 1953; M.A. Ohio 1955. Grants in aid and the Highway Act of 1956. *Syracuse*.
- RAJA CHELLIAH, B.A. St. Xavier (India) 1952; M.A. Madras 1950. Some problems of fiscal policy in under-developed countries with special reference to India. *Pittsburgh*.
- DAVID C. COLE, B.A. Cornell 1950; M.A. Michigan 1954. Provincial and local revenue of Vietnam. *Michigan*.
- MAYNARD S. COMIEZ, B.A. Syracuse 1953; M.A. 1955. Income tax administration: A study of the income tax in the United States and Wisconsin and the auditing and enforcement techniques. *Wisconsin*.
- JOHN D. COUPE, B.S. Worcester Polytechnic Inst. 1953; M.A. Clark 1957. Structural blocks to countercyclical action at state and local levels of government in Massachusetts. *Clark*.
- IRVING J. GOFFMAN, B.A. McGill 1954; M.A. Duke 1957. Erosion of the income tax base in Canada and the United States. *Duke*.
- SEVIM GORGUN, B.A. Am. College for Girls, Istanbul, 1947. Classical, welfare and Keynesian tax theory. *Syracuse*.
- JOHN F. GRAHAM, B.A. British Columbia 1947; M.A. Columbia 1948. An optimum local-aid program in a low-income province: Nova Scotia. *Columbia*.
- WALTER T. GREANEY, JR., B.A. Boston College 1942; L.L.B. Boston Univ., 1948; L.L.M. 1949; M.A. Harvard 1954. An analysis of the mass distribution and budget systems. *Harvard*.
- CLIFTON M. GRUBBS, JR., B.A. Texas 1948; M.A. 1955. Motor carrier taxation. *Harvard*.
- WILLIAM E. GUSTAFSON, B.A. Williams 1955; M.A. Harvard 1957. A model for predicting local government receipts and expenditures. *Harvard*.
- WILLIAM R. HENDLEY, B.A. Yale 1956. Swedish fiscal policy, 1946-1956. *Duke*.
- BADRI D. JAIN, B.A. Panjab—India, 1939; M.A. 1942; M.A. Vanderbilt 1948. Deficit financing and economic development—A case study of India. *Vanderbilt*.
- HARRY H. LANDRETH, JR., B.S. Oklahoma 1950; M.A. 1951; M.A. Harvard 1957. Intra-state equalization: theory and practice. *Harvard*.
- SUSAN J. LEPPER, B.A. Swarthmore 1955. Relation of tax structures to individuals disposition of wealth. *Yale*.
- ALLYN O. LOCKNER, B.A. Huron 1954. State taxation of selected metalliferous mines and mineral resources in Colorado. *Colorado*.
- HANUMANTHA RAO MACHIRAJU, B.A. Andhra Univ. 1952; M.A. 1954; LL.B. Osmania Univ., India, 1954. The expenditure tax in India. *Indiana*.
- HAROLD F. MCLELLAND, B.A. Hastings 1939; M.A. Nebraska 1940; M.S. Denver 1942; M.A. Harvard 1957. Tax aspects of the variable annuity. *Harvard*.
- JOHN C. METTLER, B.A. Washburn 1938; M.A. Rutgers 1939. Proposals for improved budgetary control. *Clark*.
- PUSHKAR N. PANT, B.A. Patna 1952; M.A. Benares Hindu 1955. A study on the budgetary problems of the underdeveloped countries with special reference to Nepal. *Vanderbilt*.
- JAMES A. PAPKE, B.A. Wayne 1954; M.A. Michigan 1955. An empirical analysis of the relative impact on corporations of a tax on value-added product. *Cornell*.
- CHARLOTTE D. PHELPS, B.A. Radcliffe 1955. The effects of tight money on capital improvement programs in municipalities which maintain capital budgets. *Yale*.
- W. DOUGLAS POE, B.S. Oklahoma A. & M. 1939. Municipal sales tax in the United States. *Indiana*.

- ARNOLD H. RAPHAELSON, B.A. Brown 1950; M.S. Columbia 1951; M.A. Clark 1956. The countercyclical effectiveness of unemployment compensation benefits and taxation in Massachusetts, 1948-1957. *Clark*.
- HARVEY SHAPIRO, B.A. City (New York) 1953; M.A. Wisconsin 1954. Metropolitan finance in Madison, Wisconsin. *Wisconsin*.
- NED SCHILLING, B.S. Purdue 1949; M.A. Columbia 1955. Theory of monopoly regulation through taxation. *Columbia*.
- ROBERT L. SLIGHTON, B.A. Princeton 1953. The treatment of losses and amortization of capital in the federal corporate income tax; A study of incentive taxation. *Johns Hopkins*.
- DONALD F. SWANSON, B.A. Knox 1950; M.A. Florida 1956. The English origins of Hamilton's fiscal policies. *Florida*.
- EDEL E. THRASH, B.A. Louisiana State 1950; M.B.A. 1951. Public financing of higher education in Louisiana. *Louisiana State*.
- RAYMOND VALENTI, B.S. Fordham 1938; M.B.A. Syracuse 1954. Life insurance company taxation. *Syracuse*.
- RAY O. WERNER, B.A. Hastings 1942; M.A. Nebraska 1947. Some economic aspects of major legislative proposals for the federal support of primary and secondary education in the United States, 1946-1958. *Nebraska*.
- GEORGE S. ZARKOS, Law Degree, Athens, Greece 1950; M.A. Indiana 1956. The Greek system of sales taxation. *Indiana*.

### International Economics

#### Degrees Conferred

- NAN L. AMSTUTZ, Ph.D. Fletcher School 1958. The establishment of an Indonesian importing class, 1950-1953.
- ZARKO BILBIJA, Ph.D. Chicago 1958. American long-term investments abroad and the export of capital goods: Latin American experience 1944-54.
- RICHARD E. CAVES, Ph.D. Harvard 1958. Recent developments in general-equilibrium international trade theory.
- DALE L. CRAMER, Ph.D. Louisiana State 1958. Relationship between monetary and fiscal policy and external policy, and their effect upon the national income and price levels in Latin America.
- NADAV HALEVI, Ph.D. Columbia 1956. Estimates of Israel's international transactions, 1952, 1953 and 1954.
- ELMER HARMON, Ph.D. Columbia 1956. Benjamin Graham and Jon Gondriaan's international commodity reserve currency proposal: a critical evaluation and comparison with other solutions to the problem of raw materials.
- GERALD E. HARRIMAN, Ph.D. Cincinnati 1958. The economics of the transition between protectionism and free trade.
- ANDREW IMRIK, Ph.D. Saint Louis 1958. Development of the idea of European economic integration.
- HARRY G. JOHNSON, Ph.D. Harvard 1958. International trade and economic growth.
- PETER B. KENEN, Ph.D. Harvard 1958. Monetary policy and the British balance of payments 1954-56.
- THOMAS M. KLEIN, Ph.D. Michigan 1958. The United Kingdom's 1947 balance of payments crisis.
- GUENTER KNACKSTEDT, Ph.D. Cincinnati 1958. The special position of the under-developed countries in GATT.
- LAWRENCE B. KRAUSE, Ph.D. Harvard 1958. Current balance of payments problems of industrial countries: an empirical study.
- MILDRED G. MASSEY, Ph.D. Oregon 1958. The Italian balance of payments, 1945-1955.

- GUENTER H. MATTERSdorFF, Ph.D. Harvard 1958. Considerations for the economic integration of Western Europe.
- RODNEY H. MILLS, Jr., Ph.D. Columbia 1958. Italy's international economic transactions, 1946-1955.
- JERZY Z. MIRSKI, Ph.D. Georgetown 1958. The dollar problem.
- AZIZALI FARRUKH MOHAMMED, Ph.D. George Washington 1958. Some aspects of the economic impact of foreign aid on an underdeveloped country: the case of Pakistan.
- FRANCIS MURANS, Ph.D. Michigan State 1957. The Reciprocal Trade Agreement program, 1945-1956.
- ERNEST W. OGRAM, Jr., Ph.D. Illinois 1957. Canada's postwar balance of payment adjustments.
- ROBERT W. OLIVER, Ph.D. Princeton 1957. The origins of the International Bank for Reconstruction and Development.
- LESLIE C. PEACOCK, Ph.D. Texas 1958. Policies and operations of the International Monetary Fund: 1947-1956.
- BELINDA K. PEARSON, Ph.D. Fletcher School 1958. Commodity reserve currency with special reference to monetary aspects.
- ROLF PIEKARZ, Ph.D. Johns Hopkins 1958. Proportion of foreign trade in national product, and economic growth.
- JEROME M. PINES, Ph.D. Columbia 1958. United States economic policy toward Germany, 1945-1949.
- GERALD A. POLLACK, Ph.D. Princeton 1958. The effect on imports from Canada of United States tariff reductions under the Reciprocal Trade Agreements Program.
- ROBERT J. SCHWARTZ, Ph.D. American 1958. Obstacles to U.S. private foreign investments 1946-1953.
- CLAUDIO SEGRÉ, Ph.D. Yale 1958. An economic analysis of the financing of capital goods exports from European countries.
- ARTHUR O. SHARON, Ph.D. American 1958. An analysis of Japan's external disequilibrium 10 years after the end of World War II.
- DAVID W. SLATER, Ph.D. Chicago 1957. The growth and structure of Canadian imports, 1926-1955.
- JOHANNES G. SNAAUW, Ph.D. New School for Social Research 1958. Problems of industrial adjustment in the European Coal and Steel Community.
- EGON SOHMEN, Ph.D. Mass. Inst. Technology 1958. Economics of flexible exchanges.
- BABETTE S. SOLON, Ph.D. Mass. Inst. Technology 1958. International trade in automobiles during 1946-1956: a study of the changes in the composition of trade.
- ROBERT M. STERN, Ph.D. Columbia 1958. World food exports and United States agricultural prices.
- JOSEPH F. TALARICO, Ph.D. Rutgers 1958. The postwar pattern of commerce and finance between the United States and Canada, 1946-1953.
- ERICK THORBECKE, Ph.D. California (Berkeley) 1957. The tendency towards regionalization in international trade, 1928-1954.
- JAROSLAV VANEK, Ph.D. Mass. Inst. Technology 1958. Natural resource content of the United States foreign trade, 1870-1955.
- JOE R. WILKINSON, Ph.D. Fletcher School 1958. Politics and trade policy: a study in the nature of the political support for the Reciprocal Trade Agreements Program, 1934-1955.
- HAROLD A. WOLZ, Ph.D. Michigan 1958. The United States sugar policy and its impact upon Cuba: a reappraisal.
- ABDUL-HASSAN ZALZALAH, Ph.D. Indiana 1957. Iraq in the Sterling Area, 1932-1954: a study in economic-political relationships.

*Theses in Preparation*

- EVANGELOS DEVLETIOGLOU, Dipl. Univ. Athens 1954. Conditions of equilibrium in the foreign exchange markets. *Columbia*.
- WILLIAM E. ESCOUBÉ, Ph.B. Chicago 1949; B.A. Harvard 1951; M.A. California (Berkeley) 1955. International trade in capital goods. *Columbia*.
- RONALD FINDLAY, B.A. Rangoon 1954. Economic development and the terms of trade. *Mass. Inst. Technology*.
- ISAIAH FRANK, B.S.S. City (New York) 1936; M.A. Columbia 1938. The European common market and third countries. *Columbia*.
- MARJORIE S. GALENSON, B.A. Barnard 1937; M.A. Columbia 1943. Some problems involved in the European common market. *California (Berkeley)*.
- RICHARD L. GORDON, B.A. Dartmouth 1956. Problems of coal pricing under the European coal and steel community. *Mass. Inst. Technology*.
- ROBERT F. HALTMIER, B.A. Hofstra 1950; M.A. Columbia 1951. Economic aspects of U.S. petroleum imports. *Columbia*.
- BERNARD B. HANON, Dipl., Faculté de Droit, Paris 1955; M.B.A. Columbia 1956. The impact of the common market on the development of the automobile industry among the common market signatories. *Columbia*.
- ERNEST E. HEIMBACH, M.S.Sc. New School for Social Research 1943; M.B.A. New York. 1946; M.A. 1951. Reciprocal trade policy of United States with Latin America. *New School for Social Research*.
- WILLIAM R. HOSKINS, B.A. Washington 1952; M.B.A. Indiana 1953. Profit opportunities for American subsidiaries in Western Europe. *Indiana*.
- STEPHEN HYMER, B.A. McGill 1955. Direct foreign investment. *Mass. Inst. Technology*.
- CHUAY KANNAWAY, B. Laws Thammasat (Thailand) 1949; B.A. Chicago 1954; M.A. Wisconsin 1957. Structural change in the pattern of world trade after World War II as a cause of world payment problems. *Wisconsin*.
- ITSUO KAWAMURA, B.A., M.A. Nagoya Univ. (Japan). Foreign trade and economic development of Japan. *Johns Hopkins*.
- MARION KRZYZANIAK, M.Econ. Poznan 1932; M.A. Alberta 1954. Homomorphic index-numbers and elasticity theorems in an open economy. *Mass. Inst. Technology*.
- KLAUS NETTER, B.S. Syracuse 1950. German foreign economic relations since World War II. *California (Berkeley)*.
- JAMES W. NORDYKE, B.A. Stanford 1952; M.A. Princeton 1957. The role of private capital export from the United States in the determination of the importance of New York as a center of international finance. *Princeton*.
- ALAN R. PLOTNICK, B.A. Temple 1949; M.A. Pennsylvania 1951. The Canadian government foreign policy—its reorientation 1946-1958. *Pennsylvania*.
- DAVID C. SMITH, B.A. McMaster 1953; B.A. Oxford 1955; M.A. Harvard 1957. Some aspects of the economic inter-connections between United States and Canada. *Harvard*.
- JEANETTE STOOPS, B.S. Purdue 1949; M.S. 1954. The effect of bulk purchase contracts on the New Zealand economy. *Bryn Mawr*.
- MAHMOOD TABATABAI, Lic. Fribourg (Switzerland) 1950. Balance-of-payments aspects of economic development in Iran. *Columbia*.
- MARIANNE Y. VICTORIUS, B.A. Guilford 1950. The role of the exchange rate in a non-viable economy: Korea. *Columbia*.
- DONALD F. WAHL, B.A. Middlebury 1953; M.A. Harvard 1955. An application of international trade theory to Canada's foreign trade. *Harvard*.
- RONALD J. WONNACOTT, B.A. Western Ontario 1955; M.A. Harvard. An input output analysis of the interrelation of the Canadian and United States economics. *Harvard*.

**Business Finance; Investment and Security Markets; Insurance***Degrees Conferred*

- VICTOR L. ANDREWS, JR., Ph.D. Mass. Inst. Technology 1958. Investment practices of corporate pension funds.
- JOHN C. DAWSON, Ph.D. Cornell 1958. Fluctuations in United States corporate investment and finance. 1931-1950. A source and uses of funds analysis.
- DANIEL E. DIAMOND, Ph.D. New York 1958. The economic impact of life insurance investments on the American economy.
- PHILIP ELKIN, Ph.D. Pennsylvania 1958. The financial experience of beneficiaries of personal living trusts in Philadelphia, 1920-1954.
- MAX E. FESSLER, Ph.D. Columbia 1958. Determining pure premium rates for hail insurance on Kansas wheat.
- ROBERT L. HILL, Ph.D. Georgetown 1958. Aggregate investment behavior of personal trusts administered by corporate trustees.
- RICHARD W. HOOLEY, Ph.D. Columbia 1957. Natural gas financing: a study of the adaptability of life insurance investment policies.
- DONALD P. JACOBS, Ph.D. Columbia 1957. Sources and costs of funds of large sales finance companies.
- HENRY KAUFMAN, Ph.D. New York 1958. The problem of funds for small business.
- HENRY A. LATANE, Ph.D. North Carolina 1957. Rational decision making in portfolio management.
- ARTHUR W. MASON, JR., Ph.D. Pennsylvania 1958. Marketing practices and newly organized life insurance companies.
- ROBERT B. MCCOSH, D.B.A. Indiana 1958. Investment opportunities in the United States 1800-1836.
- SUZANNE S. McWHORTER, Ph.D. Ohio State 1957. An analysis and evaluation of the marketing organizations, policies, and procedures of selected accident and health insurance companies.
- REX C. OLSSON, Ph.D. New York 1958. Techniques of financial planning in United States manufacturing corporations.
- CLIFFORD F. OWEN, Ph.D. Toronto 1958. Business financing and taxation policies.
- KARL W. SCHLUBACH, Ph.D. New York 1958. The rate of return on investment in financial management and investment analysis.
- HAROLD W. STEVENSON, Ph.D. Michigan 1957. Common stock financing in 1955.
- FRANCIS L. STUBBS, Ph.D. Wisconsin 1958. Financing of small and medium-sized Wisconsin manufacturing corporations, 1946-1950.
- FRANK L. TURGEON, Ph.D. New York 1958. An investment analysis of the common stocks of the domestic agricultural equipment industry.
- FESTUS J. VISER, Ph.D. New York 1958. A study of economic analysis of corporate savings.
- LELAND C. WHETTEN, Ph.D. Alabama 1957. The proxy contest—its nature, cause and significance.

*Theses in Preparation*

- DAVID ABNER III, B.A. Texas Southern 1950; M.A. 1951. Some aspects of the current status and comparative growth of Negro legal reserve life insurance companies 1930-1956. *Indiana*.
- DAVID A. BAERNCOFF, B.A. Indiana 1942; M.A. Stanford 1956. The structure of California bond rates, 1900-1957; an historical study of municipal bond yields. *Stanford*.
- WINSTON C. BEARD, B.A. Ouachita College 1953; M.B.A. Arkansas 1954. Financial and economic effects of geographical restrictions upon the investment policies of life insurance companies. *Illinois*.

- HASKEL BEN-ISHAY, M.A. Chicago 1955. Determinants of the differences in rates of return on corporate equity. *Chicago*.
- DAVID BICKELHAUPT, B.S. Pennsylvania 1951; M.S. Columbia 1952. Multiple-line insurance. *Pennsylvania*.
- RAYMOND C. BOLY, B.S. New York 1950; M.B.A. 1953. An investment appraisal of natural gas transmission company common stocks. *New York*.
- SISTER MARTIN BYRNE, B.A. Marymount (New York) 1946; M.B.A. California (Los Angeles) 1953. Religious organizations and religious body financing. *California (Los Angeles)*.
- JOHN A. CLINKENBEARD, B.A. Chicago 1947; M.B.A. 1947. An evaluation of short-term investment policies and practices of large nonfinancial corporations and their interrelationships to the money market. *Chicago*.
- JACK W. COLEMAN, B.S. Kansas 1946; M.B.A. Michigan 1952. An analysis of the working capital fund concept. *Indiana*.
- RUPERT M. CRAIG, B.A. Atlantic Union 1941; M.A. Boston Univ. 1947. The use of sale and leaseback devices for financing. *California (Los Angeles)*.
- LYNN E. DELLENBARGER, JR., B.A. Duke 1953; M.B.A. Florida 1956. A study of terms of mergers of listed industrial corporations 1950-1957. *Florida*.
- JOHN P. DEVEREAUX, B.S. Rutgers 1940; M.A. Columbia 1941. History and analysis of accounting reserves. *Pittsburgh*.
- ROBERT L. HAMMAN, B.S. Mass. Inst. Technology 1949; M.S. 1954; M.A. Harvard. Capital budgeting. *Harvard*.
- JAMES D. HAMMOND, B.A. Northwest Missouri State 1955; M.A. Pennsylvania 1956. Termination of pension plans. *Pennsylvania*.
- MUSA YUNIS HUSSAYNT, B.B.A. Am. Univ. Beirut 1935; M.B.A. 1950. Corporate profits and venture capital in the postwar period. *Michigan*.
- EASO JOHN, M.B.A. Northwestern 1955. Investment experience of twenty-five selected fire insurance companies, 1926-1956. *Northwestern*.
- MICHAEL KEARNEY, B.S., M.A. California (Los Angeles). Title insurance. *Pennsylvania*.
- KEDAR N. KOHLI, B.A. Delhi Univ. 1948; M.A. 1950; M.A. Vanderbilt 1958. Private capital markets and industrial development: a comparative study of India, Germany, United Kingdom, and the United States. *Vanderbilt*.
- ROBERT H. MILLS, B.S. Colorado 1949; M.S. 1955. A study of the effect of price level changes on business income and business planning. *Wisconsin*.
- FREDERICK E. MUELLER, Ph.B. Marquette 1948; M.B.A. Denver 1949. The causes of failure in asset liquidation in bankruptcy cases—Milwaukee County. *Wisconsin*.
- J. RUSSELL NELSON, B.A. Pacific Union 1952; M.B.A. California (Los Angeles) 1957. The role of rights in corporate financial policy with particular attention to price effects on the stock. *California (Los Angeles)*.
- LEROY L. PHAUF, JR., B.A. Randolph-Macon 1952. Juvenile insurance. *Pennsylvania*.
- JAMES P. QUIRK, B.B.A. Minnesota 1948; M.A. 1949. Increasing risk and lender behavior. *Minnesota*.
- RONALD M. REIFLER, M.B.A. Chicago 1948. Financial effects of a change in plant location. *Chicago*.
- STUART SCHWARTZSCHILD, B.S. Univ. Richmond 1938. Creditor rights in life insurance and annuities. *Pennsylvania*.
- BENJAMIN S. STEVENSON, B.A. Kenyon 1951. The common trust fund. *Ohio State*.
- GLEN TAYLOR, B.B.A. North Texas State 1950; M.B.A. 1953. The nature and development of aircraft hull insurance in the U. S. *Pennsylvania*.
- ROBERT D. TUCKER, B.A. Colorado College 1931; M.B.A. California (Los Angeles) 1948. The shortcomings of the Securities and Exchange Commission. *California (Los Angeles)*.

KENNETH J. WELLER, B.A. Hope 1948; M.B.A. Michigan 1949. An analysis & evaluation of the rights offering as a source of equity capital. *Michigan*.

EDMOND WOOLRYCH, B.A. Principia 1943; M.B.A. Harvard 1947. The effect of the growth of pension funds on other financial intermediaries. *Syracuse*.

### **Business Organization; Managerial Economics; Marketing; Accounting**

#### *Degrees Conferred*

JAMES D. BENSON, Ph.D. Iowa 1958. A study of the application of certain statistical and cartographic tools to a quantitative problem in market analysis.

WILMAR F. BERNTHAL, D.B.A. Indiana 1957. A study of the foreman's committee role in the management of selected industrial plants.

WILLIAM T. BLUMQUIST, D.B.A. Indiana 1957. The relationship between job satisfaction and personnel practices among selected Ohio hospitals.

RAYMOND D. BUTEUX, Ph.D. New York 1957. On the indirect extension of advertised ideas.

ROBERT D. BUZZELL, Ph.D. Ohio State 1957. Productivity in marketing: with special reference to drug and hardware wholesalers.

NORMAN S. CANNON, Ph.D. Columbia 1958. Some selected problems in accounting for executive compensation.

ROCCO CARZO, JR., D.B.A. Indiana 1958. Inventory decision-making and economic theory.

ROBERT J. CHAPEL, Ph.D. Pittsburgh 1958. The control of sales by manufacturers: a theory of successful sales management.

CLARK E. CHASTAIN, Ph.D. Michigan 1958. Depreciation policies of the steel industry for 1940-56 with special emphasis on the adequacy of depreciation allowances.

RONDO A. CHRISTENSEN, Ph.D. Cornell 1957. A business management study of seventy-three retail farm equipment firms, New York, 1955.

ROBERT G. COOK, D.B.A. Indiana 1958. Liaison in management organization theory.

JOHN W. DARR, Ph.D. Alabama 1957. Selected problems of personnel administration.

HARRISON L. GRATHWOHL, D.B.A. Indiana 1957. The impact of trading stamps on retail advertising and pricing practices in Indianapolis, Indiana.

CHADWICK J. HABERSTROH, Ph.D. Minnesota 1958. Processes of internal control in firms.

MARVIN HOFFMAN, Ohio State 1957. Supplementary wage benefits for outside salesmen.

ALBERT HOLZMAN, Ph.D. Pittsburgh 1958. Some aspects of the problem of unplanned plant maintenance.

ALLEN F. JUNG, Ph.D. Chicago 1957. Estimation of the variation in costs to retail buyers of automatic washing machines.

BARKEV KIBARIAN, Ph.D. New York 1958. A definitive study of the women's costume-jewelry industry from a managerial viewpoint.

RONALD R. LARSON, D.B.A. Indiana 1957. The impact of trading stamps on consumers in Indianapolis, Indiana.

JOHN MASEK, Ph.D. Chicago 1957. A study of the usefulness of motivation research in improving the efficiency of direct mail selling efforts.

FREDERICK E. MAY, Ph.D. Michigan 1958. Attributes of car owners influencing their car purchasing behavior.

BERT C. McCAMMON, JR., D.B.A. Indiana 1957. The effect of trading stamps on the operations of Indianapolis retailers.

EDMUND J. MCCARTHY, Ph.D. Minnesota 1958. An analysis of the use of marketing research in product development.

BRUCE D. McSPARRIN, JR., D.B.A. Indiana 1958. A study of the role of the purchasing executive and his function in materials management in manufacturing firms.

- HENRY L. MUNN, Ph.D. Chicago 1957. An exploratory investigation of brand perception by specified classes of consumers for specified classes of consumer goods.
- JEAN NAMIAS, Ph.D. New York 1958. A study of the relationship between consumers' intentions and their actions in the market for household goods.
- WARREN B. NATION, Ph.D. Alabama 1957. Schwegmann Brother—a study of supermarket growth and its economic significance.
- WALTER G. O'DONNELL, Ph.D. Columbia 1958. The value structure of corporate decisions.
- ERIC C. OESTERLE, Ph.D. Purdue 1957. A financial analysis of independent food stores in Indiana.
- LEONARD W. PRESTWICH, Ph.D. Ohio State 1957. Store hours in retailing with particular emphasis on night openings.
- HAROLD F. PUFF, D.B.A. Indiana 1957. Organization practices and problems of a selected group of small manufacturing companies in southwestern Ohio.
- LORENZO T. REEVES, JR., Ph.D. Northwestern 1958. A study of changes occurring in the wholesaling of major appliances since 1920, with emphasis on the period 1939-1956.
- ISAAC N. REYNOLDS, Ph.D. North Carolina 1957. The impact of the choice of base and method of amortization of long-term cost on financial and other business policies.
- MARGUERITE L. RITTENHOUSE, Ph.D. New York 1958. An examination of marketing research theories and practices for the introduction of new products.
- WILLIAM G. SCOTT, D.B.A. Indiana 1957. The design and use of a human relations training program for middle management.
- MALCOLM F. SEVERANCE, Ph.D. Wisconsin 1958. Budgeting, programming, and decision-making in excellently managed companies.
- WILFRED N. SMITH, D.B.A. Indiana 1958. Production management and the laboratory method.
- BURNARD H. SORD, Ph.D. Texas 1958. A study of planning and control policies and practices employed by selected American companies, with special emphasis on budgeting.
- LYNN H. STOCKMAN, Ph.D. Northwestern 1957. The influence of consumer deals on urban household purchases of butter, margarine, vegetable shortening, and salad and cooking oils in metropolitan Chicago.
- REED K. STOREY, Ph.D. California (Berkeley) 1958. Matching revenues with costs: an analysis of accounting adaptation to uncertainty.
- DANIEL L. SWEENEY, Ph.D. Michigan 1958. Accounting and financial problems of executive stock option plans.
- HARLON D. TRAYLOR, Ph.D. Cornell 1958. Some effects of film packages and uniform sizing on retail potato sales.
- ROBERT T. TUSSING, Ph.D. Texas 1957. A survey of electronic data processing and its potential impact upon accounting procedures, personnel, and education.
- LOUIS D. VOLFF, Ph.D. Iowa 1958. A theoretical approach to the determination and use of sales potentials for geographic allocation of marketing efforts.
- JOHN S. WAGLE, Ph.D. Ohio State 1957. An analysis of the marketing of utility airplanes with emphasis on marketing practices and problems of manufacturers.
- EDWARD L. WALLACE, Ph.D. Chicago 1957. Electronic data processing equipment in production planning and inventory control.
- C. EDWARD WEBER, Ph.D. Princeton 1958. Managerial growth and development: a tentative explanation of the increasing use of managerial manpower in comparison to total manpower.

#### *Theses in Preparation*

- DEAN S. AMMER, B.S. Mass. Inst. Technology 1948; M.B.A. New York 1956. The theory of materials management. *New York*.

- SAMUEL R. ANDERSON, B.B.A. Michigan 1952; M.B.A. 1953. The impact of the "new" competition upon the small department store. *Michigan*.
- THOMAS L. BEGG, B.B.A. Minnesota 1951; MS. Columbia 1956 The management of marketing channels. *Columbia*.
- CHARLES P. BONINI, B.A. Holy Cross 1955; M.S. Carnegie Inst. Technology 1956. A study of accounting and other information flows and their effects upon the decisions of a firm. *Carnegie Inst. Technology*.
- FREDERICK A. BRETT, B.S. Alabama 1954; M.S. 1955. Problems encountered in using accounting data for economic analysis. *Alabama*.
- LEONARD R. BURGESS, B.A. Brown 1942; M.B.A. Harvard 1947. Compensation of top executives in industry. *Columbia*.
- PAUL W. BURNHAM, B.A. Hardin-Simmons 1934; M.B.A. Texas 1939. The integration of accounting with the economic development of the South—1900-1950. *Alabama*.
- BUFORD A. CASEY, B.A. Bridgewater 1938; M.B.A. Harvard 1947. New industrial products marketing in theory and practice. *Ohio State*.
- WILLIAM H. COOPER, B.S. Grove City 1937; M.B.A. Pennsylvania 1949. Comparisons and contrasts between the administrative philosophies of the Elton Mayo School and Frederick W. Taylor. *Pennsylvania*.
- JACOB D. CORRIHER, JR., B.S. Bowling Green 1949; M.B.A. Indiana 1950. Application of generally accepted principles of accounting to railroad operations. *Alabama*.
- ALFRED A. COX, B.S.E. Arkansas State Teachers 1949; M.B.A. Arkansas 1954. The marketing of new automobiles by franchised dealers. *Ohio State*.
- EDWIN W. CROOKS, JR., B.S. West Virginia 1941; M.B.A. Harvard 1947. The history of the Halle Bros. Co. *Indiana*.
- H. ROBERT DODGE, B.S. Ohio State 1951; M.B.A. 1954. Incentive compensation for sales executives. *Ohio State*.
- FRANKLIN B. EVANS, B.A. Chicago 1943; M.B.A. 1954. Analysis of automobile purchasers: the discriminatory efficacy of demographic and psychological variables. *Chicago*.
- PAUL F. FAGAN, B.A. Connecticut 1949; M.A. 1950. Profit control for decentralized divisions. *Columbia*.
- WILLIAM A. FLINN, B.S. Davidson 1933; M.B.A. Harvard 1936. Retail Credit Company, Inc.—A case study in marketing management. *Ohio State*.
- JAY R. GREENE, B.A. Los Angeles State 1949; M.B.A. California 1951. Use of general-purpose electronic computers in the solution of marketing problems. *Ohio State*.
- GEORGE R. HALL, B.A. Claremont 1951; M.A. Harvard 1953. The lumber industry: workable competition in a purely competitive industry. *Harvard*.
- BROTHER PATRICK J. HANCE, S.M., B.S. Dayton 1953; M.A. Catholic 1956. The history of accounting in the United States prior to 1925. *Catholic*.
- KEITH HELLER, B.S. Lewis & Clark 1952; M.S. Oregon 1954. Development of accounting in the United States. *Minnesota*.
- ROBERT M. JENNINGS, B.S. Louisville 1949; M.B.A. 1952. George S. Olive and Company—a business history. *Indiana*.
- HOWARD E. JONES, JR., B.S. Alabama 1950; M.S.C. 1958. Earned surplus and earned surplus reserves. *Alabama*.
- WALTER H. KRAMER, B.S. DePaul 1947; M.B.A. Oregon 1956. The agency in the marketing of air travel. *Indiana*.
- PAUL G. LAGRONE, B.S. Bowling Green 1947; M.B.A. Denver 1948. Financial and accounting problems in the expansion of the natural gas industry. *Alabama*.
- HAROLD B. LEGRANDE, M.B.A. Chicago 1948. An empirical analysis of the contribution of marketing surveys in providing information for management on consumer attitudes. *Chicago*.

- ROBERT W. LITTLE, B.S. Indiana 1953; M.B.A. 1956. Selected major trends in wholesaling. *Indiana*.
- WALLACE G. LONERGAN, B.A. College of Idaho 1950; M.B.A. Chicago 1955. Personnel administration at the executive level—a forecast of manpower needs in Swift and Company. *Chicago*.
- CHARLES F. LOUIE, B.S. California 1954; M.B.A. 1955. Accounting for pension costs. *California (Berkeley)*.
- RAYFORD J. McLAURIN, B.S. Bowling Green 1948; M.B.A. Alabama 1951. The role of the accountant in anti-monopoly cases since World War II. *Alabama*.
- DONALD MILLS, B.S. Alabama 1942; LL.B. West Virginia 1950. The analysis of recent trends in the presentation of net worth. *Alabama*.
- WALTER G. MITCHELL, B.S. U. S. Military Academy 1943; M.B.A. Columbia 1953. The management of "fair trade." *Columbia*.
- EDWARD J. MORRISON, B.S. West Virginia 1952; M.B.A. Indiana 1955. Applying management fundamentals to life insurance agencies. *Indiana*.
- MELVIN S. MOYER, B.Comm. Toronto 1953; M.Comm. 1956. Specification buying: a form of vertical integration. *Columbia*.
- CHARLES S. NAGY, B.S. Indiana State 1947; M.S. 1949. An investigation of operations research and some of its effects upon accounting. *Alabama*.
- DAVID W. ORTLIEB, B.S. Lawrence 1955; M.B.A. Indiana 1957. The relation of management philosophy to the corporate personality of a pharmaceutical company. *Indiana*.
- PARLEY M. PRATT, B.A. Utah 1950; M.B.A. Harvard 1954. Marketing of rice. *Ohio State*.
- JOSEPH C. SCHABACKER, B.S. Temple 1943; M.B.A. California (Los Angeles) 1952. Cash planning in the small manufacturing firm. *California (Los Angeles)*.
- RAYMOND H. SCOTT, B.A. Montana State 1938; M.B.A. Washington 1953. Technological and operational changes in general line grocery wholesaling. *Ohio State*.
- LYNDD V. SEAWELL, B.B.A. Wake Forest 1953; M.B.A. Indiana 1954. An evaluation of selected annual reports of American industrial corporations for compliance with certain pronouncements of the American Institute of Certified Public Accountants. *Indiana*.
- WADE P. SEWELL, B.S. Illinois 1947; M.S. 1949. A stochastic production function study of aircraft operation. *Chicago*.
- RALPH E. SKELLEY, B.S. Missouri 1953; M.A. 1954. Comparative bank accounting practices in Missouri. *Alabama*.
- ANDREW C. STEDRY, B.S. Carnegie Inst. Technology 1956; M.S. 1957. Budget control and cost behavior. *Carnegie Inst. Technology*.
- LOUIS L. STERN, B.S.B.A. Marquette 1952; M.B.A. Northwestern 1955. The marketing of butter: a critical appraisal. *Northwestern*.
- SERGIO TALACCHI, M.A. Michigan State 1956. Differential analysis of institutional processes and patterns. *Chicago*.
- HILDA C. WASSON, B.S. Bowling Green 1940; M.B.A. Indiana 1953. Role of the markdown in retail pricing policies. *Indiana*.
- JAMES H. WOLTER, B.S. Illinois 1949; M.B.A. Indiana 1955. An analysis of the process of new product idea evaluation by selected consumer goods manufacturers. *Indiana*.

### Industrial Organization; Government and Business; Industry Studies

#### Degrees Conferred

- WILLIAM L. BALDWIN, Ph.D. Princeton 1958. Changing concepts of the large firm and anti-trust enforcement.
- ROBERT A. BATTIS, Ph.D. New York 1958. Entrepreneurship, technological innovation, and economic change in the iron industry: a case study.

- ABRAHAM S. BECKER, Ph.D. Columbia 1958. Economics of the cotton textile industry of the USSR.
- ROBERT G. FEDERICK, Ph.D. Harvard 1958. The economics of Greater Boston's Metropolitan Transit Authority.
- JOHN DOUTT, Ph.D. Pittsburgh 1957. Economic factors in the development of the paint and varnish industry with special attention to their marketing implications.
- HUBERT C. EDGEWORTH, Ph.D. Alabama 1957. Development of national policy of financial aid to the American Merchant Marine.
- NYLEN W. EDWARDS, D.B.A. Indiana 1957. The urban traffic congestion and a solution: with special reference to mass transit.
- JOHN L. ENOS, Ph.D. Mass. Inst. Technology 1958. History of cracking in the petroleum refining industry: the economics of a changing technology.
- RICHARD N. FARMER, Ph.D. California (Berkeley) 1957. Maritime operating differential subsidies.
- JACK GUTTENTAG, Ph.D. Columbia 1958. Some studies of the post-war residential construction and mortgage markets.
- R. HOLLBACH, Ph.D. McGill 1958. The Canadian primary aluminum industry.
- LAWRENCE J. KAPLAN, Ph.D. Columbia 1958. Factors affecting productivity in the home-building industry.
- BERNARD A. KEMP, Ph.D. Vanderbilt 1957. The merger component in the growth of a firm.
- RALPH L. KOORENNY, Ph.D. Colorado 1957. Strategic sectors of the steel industry in the western U. S. in the light of location theory and the complex of industry concept.
- T. E. KUHN, Ph.D. McGill 1957. The economics of road transport.
- LEONARD W. MARTIN, Ph.D. Columbia 1957. Integration between manufacturing and retailing in shoes.
- W. DAVID MAXWELL, Ph.D. Johns Hopkins 1958. Product rate discrimination or value-of-service pricing in motor trucking.
- ROBERT S. M. NIELSEN, Ph.D. California (Berkeley) 1958. Ownership of tankers: the independents versus the integrated oil companies.
- CHIU-HOCK QUAN, Ph.D. Colorado 1957. The economics of natural and synthetic rubber.
- EDWARD P. REAGEN, Ph.D. Indiana 1958. The ceramic dinnerware industry in the U. S.
- MIGUEL A. REGUERO, Ph.D. New York 1958. An economic study of the military airframe industry.
- JACK C. ROTHWELL, Ph.D. Texas 1958. The conservation program of the Railroad Commission and the structure of crude oil prices in Texas.
- ERIC SCHENKER, Ph.D. Florida 1957. A port authority for the State of Florida.
- WILLIAM SCHUSLER, Ph.D. Pittsburgh 1958. Railroad commuter service in the Pittsburgh area: its history, present and future.
- BERNARD SCHULL, Ph.D. Wisconsin 1957. Price discrimination in the corn products confectionery industrial pattern.
- MILES H. SONSTEGAARD, Ph.D. Oregon 1958. Location-size theory for multiple-source, nonclustered industries.
- DONALD STREET, Ph.D. Columbia 1958. Railroad equipment financing.
- HARRY M. TREBING, Ph.D. Wisconsin 1958. Project-evaluation techniques for federal multiple purpose projects.
- OTHEL DEV. TURNER, Ph.D. Texas 1958. Industrial location factors in Wyoming: A functional analysis.
- ROBERT B. WILLIAMSON, Ph.D. American 1958. Electric retail rate increases and farm uses of electricity.
- JOSEPH ZAREMBA, Ph.D. Harvard 1958. Some problems in forecasting future wood requirements.

*Theses in Preparation*

- WILLIAM R. BEATON, B.S. Stetson 1950; M.S. Florida State 1952. An analysis of the philosophies prompting the establishment of governmental insurance programs, with particular emphasis on the atomic risk. *Ohio State*.
- ELEANOR CRAIG, B.A. North Carolina 1947; M.A. 1950. A recent history of the North Carolina furniture industry, with special attention to locational factors. *Duke*.
- JOHN R. DAVIDSON, B.S. Bowling Green 1933; M.S. New York 1940. Effect of the Robinson-Patman Act upon cooperative advertising. *Ohio State*.
- CHARLES DEAKTOR, B.S. Pittsburgh 1951; M.L. 1952. The economic impact of the frozen food industry. *Pittsburgh*.
- BETTY DERAN, B.A. Fresno State 1954. Western mobile home industry. *California (Berkeley)*.
- FRED DZIADEK, B.A. Columbia 1955. The determination of U. S. postal rates. *Johns Hopkins*.
- CHARLES E. EDWARDS, B.S. Georgia Inst. Technology 1952; M.S. 1953. A study of the financial aspects of the recent merger movement among the small manufacturers in the automobile industry. *North Carolina*.
- DAVID K. EITEMEN, B.B.A. Michigan 1952; M.A. California (Berkeley) 1956. Financial effect upon public utility companies of the type of rate base adopted by state regulatory commissions. *Northwestern*.
- ORVILLE ELLIOTT, B.S. Oklahoma A. & M. 1955; M.S. 1956. An analysis of the production and distribution of electric power by the Grand River Dam Authority. *Oklahoma*.
- EVELYN L. ENCHES, B.S. Minnesota 1923; M.A. Southern California 1928. Consumer protection in Great Britain. *California (Los Angeles)*.
- LIONEL EPSTEIN, B.S. New York 1953; M.A. Harvard 1956. Military procurement and its effect on the manufacturing industries of Connecticut and Massachusetts. *Harvard*.
- DANIEL O. FLETCHER, B.A. Oberlin 1952; M.A. Michigan 1956. Economics of domestic Great Lakes water transportation. *Michigan*.
- HELMUT J. FRANK, B.S. Columbia 1948; M.A. 1950. The pricing of Middle East crude oil. *Columbia*.
- JOSEPH GOLDMAN, B.A. Brooklyn College 1947; M.A. Columbia 1950. Economic and social factors in the history of the southern iron and steel industry, 1850-1914. *Columbia*.
- IRVIN GROSSACK, B.A. City (New York) 1956. A measurement of changes in industrial structure overtime. *Columbia*.
- HENRY GROSSMAN, The problem of using reasonable market price in the federal regulation of natural gas production. *Georgetown*.
- FRANK L. HENDRIX, B.S. Tennessee 1949; M.S. 1950. A study of monopoly power in the newsprint industry. *North Carolina*.
- CHARLES F. HEYE, B.B.A. Texas 1943; M.B.A. Maryland 1947. Public utility regulation in the State of Maryland. *Pennsylvania*.
- WILLIAM R. HUGHES, B.A. Maryland 1953; M.A. Harvard 1957. Firm size in electric power industry. *Harvard*.
- HAROLD KATZ, B.A. Brandeis 1956. The effect of electronic data processing innovations on diseconomies of management and optimum firm size. *Columbia*.
- ARTHUR J. KIRSCH, M.A. California (Los Angeles) 1954; B.S. California (Berkeley) 1952. The motion picture industry—an economic study of antitrust policy. *California (L.A.)*.
- DONALD W. LOEWECHE, B.A. Roosevelt 1954; M.A. Illinois 1955. The economic and financial implications of obsolescence. *Illinois*.
- PAUL W. MACAVOY, B.A. Bates 1955. Price determination in natural gas industry. *Yale*.
- DONALD A. MARKWALDER, B.S. Illinois State Normal 1952; M.A. Northwestern 1957. The flour milling industry—an economic study of excess capacity. *Northwestern*.

- PETER MAX, B.A. Williams 1955. The regulation of the field price of natural gas. *Cornell*.
- ALAN T. NICHOLS, B.A. Oklahoma 1952. Industrial concentration and census data. *Wisconsin*.
- INGOLF H. E. OTTO, B.A. Cincinnati 1941; M.A. George Washington 1950. Public control of the insurance industry. *George Washington*.
- EDWARD D. PETERSON, B.A. Iowa State 1951; M.B.A. Indiana 1953. Selected issues arising from government regulation of the public utility industries. *Indiana*.
- PHILIP J. REINERTSEN, B.A. Dartmouth 1947; M.A. Chicago 1954. The pulp and paper industries in Sweden and Canada. *Chicago*.
- ALLEN SELF, B.A. Texas A. & M. 1947; M.A. North Texas State 1949. Municipal electric utility systems in Oklahoma. *Oklahoma*.
- NEIL SHIFFLER, B.S. Pennsylvania 1948; M.B.A. Michigan 1950. Distribution of milk under the Pennsylvania milk control law. *Pittsburgh*.
- DOUGLAS J. STALLEY, B.Ec. Univ. Adelaide 1948; M.Ec. 1955. Monopoly and competition in Australia. *Columbia*.
- ALBERT G. SWEETSER, B.A. Harvard 1937; M.B.A. New York 1942. Public warehouses in U.S.; their nature, regulation and legal position. *American*.
- PERRY D. TEITELBAUM, B.S. City (New York) 1946; M.A. Columbia 1948. Nuclear energy and the U. S. fuel economy. *Chicago*.
- MATTHEW VLAHAKIS, B.A. School of Economics, Athens, Greece 1949. Market behavior and governmental policy in the industries in Greece. *Columbia*.
- HAROLD WEIN, B.S. City (New York) 1936; M.A. Columbia 1938. An analysis of economics and law of some recent merger cases in the steel industry. *Pittsburgh*.
- RAYMOND WHITSON, B.A. Oklahoma 1952; M.A. 1957. Southwestern power administration and generation and transmission cooperatives. *Oklahoma*.
- HENRY B. WILSON, B.S. Alabama 1949; M.S. 1951. The dynamics of industrial location. *Alabama*.
- JAMES S. WORLEY, B.A. Vanderbilt 1949; M.A. 1950. Industrial research and the new competition. *Princeton*.
- FRANK WRIGHT, B.S. Duquesne 1947; M.B.A. Pennsylvania 1949. The Pittsburgh railways: a valuation. *Pittsburgh*.

### Land Economics; Agricultural Economics; Economic Geography; Housing Degrees Conferred

- BABU LAL AGRAWAL, Ph.D. Cornell 1958. A study of agricultural cooperatives in Western Uttar Pradesh (India) with special reference to agricultural credit.
- MATTHEW AMAT, Ph.D. Columbia 1958. Economics of the forestry industry in Yugoslavia.
- FRED B. ANDERSON, Ph.D. Florida 1958. An economic evaluation of custom harvesting of potatoes by packing plants.
- HENRIK J. AUNE, Ph.D. Minnesota 1958. An economic analysis of labor inputs in dairying as affected by size of herd and types of equipment.
- RAYMOND A. BAILEY, Ph.D. Ohio State 1957. Input-output data for the commercial swine enterprise in Ohio.
- RICHARD BERE, Ph.D. Ohio State 1958. An economic analysis of the grading, packaging and marketing of apples, with special reference to pre-packaged apples.
- CALVIN R. BERRY, Ph.D. Purdue 1957. An economic analysis of fertilizer marketing and pricing with particular reference to Indiana.
- WALTER D. BOWLES, Ph.D. Columbia 1958. The economics of the Soviet logging industry.
- GEORGE A. BRABB, Ph.D. Illinois 1958. The relation of prices and other factors to change in production of corn.

- ROBERT K. BROWN, Ph.D. Pittsburgh 1958. The legislative background of public housing and its financial impact, especially on the Pittsburgh area.
- VERE E. BUTTON, Ph.D. Wisconsin 1958. Wisconsin vegetables for commercial processing production: production areas and markets.
- TZE-I. CHIANG, Ph.D. Florida 1958. Marketing Florida asparagus plumosus ferns.
- SHIH AN CHEIN, Ph.D. Ohio State 1957. Frozen foods with special reference to consumer use in Columbus, Ohio.
- GEORGE R. DAWSON, Ph.D. Cornell 1958. Economics of forage production and utilization, north country region. New York, 1955-56.
- JOHN A. DAWSON, Ph.D. Chicago 1957. The demand for irrigation water in the Ainsworth area of Nebraska.
- GERALD W. DEAN, Ph.D. Iowa (Ames) 1957. Supply functions for hogs.
- MICHELE DE BENEDICTIS, Ph.D. Iowa (Ames) 1957. Intratemporal resource efficiencies in leasing systems—an application of linear programming.
- EDDIE V. EASLEY, Ph.D. Iowa (Ames) 1957. An application of linear programming to the study of supply response in dairying.
- ROBERT M. FISHER, Ph.D. Columbia 1958. Economic aspects of the federal low-rent public-housing program.
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- GANIYU JAWANDO, Ph.D. Minnesota 1958. The role of agriculture in the economic development of Nigeria.
- LINLEY E. JUERS, Ph.D. Minnesota 1957. An economic analysis of the operating costs of butter-powder plants with particular reference to the problems of joint costs.
- JERZY F. KARCZ, Ph.D. Columbia 1958. Soviet agricultural marketings and prices, 1928-1954.
- SHOHEI KAWAKATSU, Ph.D. Wisconsin 1957. Some methods of estimating fertilizer response functions for refinement of diminishing returns analysis.
- ELMER R. KIEHL, Ph.D. Harvard 1958. Consumer evaluation of the product characteristics of beef.
- SIDNEY KLEIN, Ph.D. Columbia 1957. The patterns of land tenure reform in East Asia after World War II.
- ARVID C. KNUBTSON, Ph.D. Minnesota 1957. An analysis of processing costs in specialized butter plants receiving whole milk.
- DONALD LELONG, Ph.D. Syracuse 1957. Factors affecting supply and demand in the New York milk market.

- LAUREL D. LOFTSGARD, Ph.D. Iowa (Ames) 1958. Linear programming of dynamic plans for an actual farm and household.
- STANLEY T. LOWRY, Ph.D. Louisiana State 1958. Analysis of early theories on natural resources.
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- DONALD S. MOORE, Ph.D. Minnesota 1957. A study of the effect of individual motivations and of farm business-household relationship upon the organization and operation of 29 southeastern Minnesota farms, 1928-55.
- HUGH L. MOORE, Ph.D. Wisconsin 1958. Adjustments to bulk procurement in federal order pricing in Chicago.
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- HEUNG KEUN OH, Ph.D. Ohio State 1957. An analysis of factors influencing soft red winter wheat production.
- GOGULA PARTHASARATHY, Ph.D. Wisconsin 1958. Underemployment and the Indian agriculturist.
- ROBERT H. PERSONS, JR., Ph.D. Columbia 1957. Agricultural land use in the south plains of Texas, 1890-1950.
- LEE E. PRESTON, JR., Ph.D. Harvard 1958. An economic analysis of exploration for non-ferrous metals.
- EDWARD F. RENSHAW, Ph.D. Chicago 1958. An economic appraisal of public investment in irrigation.
- WILLIAM RICHIE, Ph.D. Ohio State 1958. History and development of agricultural cooperatives in Ohio.
- HOWARD F. ROBINSON, Ph.D. Ohio State 1957. History and evaluation of trading in futures in potatoes, 1930-1956.
- RAYMOND W. ROBINSON, Ph.D. Wisconsin 1957. Costs and efficiency of wholesale milk distribution in Milwaukee with particular reference to problems of wholesale pricing.
- LOY L. SAMMET, Ph.D. California (Berkeley) 1958. Economic and engineering factors in agricultural processing plant design.
- FRED B. SAUNDERS, Ph.D. Iowa (Ames) 1958. Farm and nonfarm adjustment opportunities for specified resource situations for families on small owner-operated farms, Piedmont area, Georgia.
- ADNAN S. SHUMAN, Ph.D. Ohio State 1957. A suggested plan for the Syrian agricultural cooperatives based upon a study of selected agricultural cooperatives in Ohio and in the United States generally.
- WESLEY G. SMITH, Ph.D. Iowa (Ames) 1958. Dynamic linear programming of conservation alternatives, including household consumption.
- JAMES F. TUCKER, JR., Ph.D. Pennsylvania 1957. British agriculture under protection and free trade, 1815-1895.
- VIIR VIRANJAN SINGH TYAGI, Ph.D. American 1958. Economic impact of partition on Indian agriculture.

- LALGUDI SIVASUBRAMANIAN VENKATARAMANAN, Ph.D. Chicago 1958. A statistical study of Indian jute production and marketing with special reference to foreign demand.
- ARTHUR J. WALRATH, Ph.D. Wisconsin 1957. Impacts of the expanding urban-rural economy in southeastern Wisconsin.
- GARLAND P. WOOD, Ph.D. Wisconsin 1958. An economic analysis of range reseeding in northern Nevada.
- GEORGE M. WOODWARD, Ph.D. North Carolina 1958. The economics of commercial fishing with special application to North Carolina.
- WILLIAM D. WUBBEN, Ph.D. Claremont 1958. The economic aspects of the California liquefied petroleum gas industry.
- RICHARD B. ZOLLER, Ph.D. Minnesota 1958. The vertical-block budgeting system—a new farm planning technique.

### *Theses in Preparation*

- GEORGE L. ALMOND, B.S. Ohio State 1951; M.A. 1955. Warehousing of food products. *Ohio State*.
- RAYMOND L. ANDERSON, B.S. Minnesota 1951; M.S. 1954. Development of public recreational use of private land in Wisconsin. *Wisconsin*.
- WALLACE BARR, JR., B.S. Ohio State 1943. Projection and analysis of long time economic trends in agricultural and related industries. *Ohio State*.
- HAROLD D. BIRCKMAYER, B.A. Cornell 1952; M.B.A. 1956. The effect of incentives on petroleum exploration and production, with emphasis on percentage depletion. *Cornell*.
- MELVIN BLASE, B.S. Missouri 1955; M.S. 1956. Erosion control in process in Western Iowa. *Iowa (Ames)*.
- MICHAEL F. BREWER, B.S. Yale 1953; M.S. Michigan 1955. Water pricing and allocation with particular reference to California irrigation districts. *California (Berkeley)*.
- MARTIN K. CHRISTIANSEN, B.S. Minnesota 1950; M.S. 1956. An analysis of costs of retail milk delivery in Minneapolis and St. Paul. *Minnesota*.
- CLARENCE F. DAVAN, B.S. Purdue 1952; M.S. 1953. Effects of a beef price support program on producers, marketing agencies and consumers. *Purdue*.
- CARLETON C. DENNIS, B.S. Michigan State 1955. Interregional competition in the frozen strawberry industry. *California (Berkeley)*.
- MAURICE DE YOUNG, B.C.S. Tulane 1956; M.A. 1957. Arboriculture in the Haitian economy. *Florida*.
- WILLIS EICHBERGER, B.S. Nebraska 1940; M.A. 1954. Economic framework for analyzing land development in lower Mississippi Valley. *Iowa (Ames)*.
- R. VERN ELEFSON, B.S. Missouri 1953. The influence of landlords on major farm operating decisions. *Minnesota*.
- JOSEPH R. EWERS, B.A. Bowling Green 1950; M.S. 1954. Possible housing policies of the federal government 1960-1970. *Indiana*.
- SIDNEY P. FELDMAN, B.S. Indiana 1953; M.B.A. 1954. Demographic factors affecting the demand for housing 1960-1970. *Indiana*.
- LONNIE L. FIELDER, B.S. Louisiana State 1951; M.S. 1953. Alternative parity formulas for cotton. *Iowa (Ames)*.
- WAYNE FULLER, B.S. Iowa (Ames) 1955; M.S. 1957. Alternative parity formulas for corn. *Iowa (Ames)*.
- WILLIAM E. GOBLE, B.S.A. Georgia 1949; M.S. Tennessee 1950. Variations in livestock receipts and shipments in the Sioux City terminal market. *Iowa (Ames)*.
- ABRAHAM GOLDBLATT, B.A. California 1947. Structure of rooming house markets in New York City. *Columbia*.
- REGINALD K. HARLAN, B.S. Texas Tech. 1949; M.S. 1954. Possibilities and implications of vertical integration in corn production. *Ohio State*.

- JOSEPH C. HEADLEY, B.S. Illinois 1952; M.S. 1955. The contribution of irrigation to regional differentials in technological change. *Purdue*.
- JAMES F. HUDSON, B.S. Louisiana State 1942; M.S. 1945. Accuracy of pricing cottonseed for crushing purchases in Louisiana. *Iowa (Ames)*.
- JACK D. JOHNSON, B.S.A. Georgia 1947. M.S.A. 1948. Cattle prices at auctions in the Appalachian area. *Iowa (Ames)*.
- PAUL R. JOHNSON, B.A. Oberlin 1950; M.S. North Carolina State 1953. Analysis of changes in corn yields. *Chicago*.
- MONTÉ E. JULLERAT, B.S. Purdue 1956. M.S. 1958. The pricing structure for soybeans at the county elevators and processors in Indiana. *Purdue*.
- JOHN E. KADLEC, B.S. Purdue 1953; M.S. 1957. Alternative methods of estimating supply functions for milk in the Louisville milk shed. *Purdue*.
- WILLIS G. KEARL, B.S. Utah State 1949; M.S. 1951. Economic use and integration of pasture for beef cattle production in California. *California (Berkeley)*.
- NORMAN LANDGREN, B.S. Nebraska 1951; M.A. 1954. Economics of watershed development. *Iowa (Ames)*.
- ROBERT E. LAUBIS, B.S. Ohio State 1949; M.S. 1956. Improving the financial management of agricultural marketing agencies in Ohio. *Ohio State*.
- GREGOR LAZARCIK, M.Sc. Brno 1948; M.A., Q.D. Paris 1953. Production and productivity in Czechoslovak agriculture, 1946-1956. *Columbia*.
- IRA S. LOWRY, B.A. Texas 1950; M.A. 1951. The spatial organization of cities. *California (Berkeley)*.
- RICHARD J. MCCONNEN, B.S. Montana State 1952; M.S. 1954. Economic analysis of dry land range fertilization in California. *California (Berkeley)*.
- BERNARD MELTZER, B.C. City (New York) 1938; M.A. Pennsylvania 1948. Real estate prices in Philadelphia. *Pennsylvania*.
- JAMES MILLER, B.S. Pittsburgh 1943; M.S. 1951. The economic effects of sewage treatment on residential construction. *Pittsburgh*.
- A. MILTON MOORE, B.A. Queen's Univ. 1949. The pricing of Crown timber in Eastern Canada. *Chicago*.
- CHARLES V. MOORE, B.S. Ohio State 1953; M.S. 1956. An analysis of farm accounting procedures in common usage and the development of a more effective system for the present-day commercial farm. *Ohio State*.
- JOHN T. MOORE, B.A. Indiana 1949; M.A. 1956. Fuel and energy requirements for Arkansas industrial expansion. *Indiana*.
- RAYMOND C. NICHOLSON, B.S. Manitoba 1950; M.S. 1957. Production adjustments (scale and supply response). *Purdue*.
- JERRY H. PADGETT, B.S. Clemson 1954; M.S. 1954. Transportation patterns and marketing methods for Indiana milk. *Purdue*.
- ROSS M. PARISH, B.S. Univ. of Sydney, 1951. Wheat production and the demand for land. *Chicago*.
- GLEN R. PURNELL, B.S. Utah State 1952; M.S. Montana State 1953. Alternative parity formulas for dairy products. *Iowa (Ames)*.
- EMILIO U. QUINTANA, B.S. Univ. of Philippines 1952; M.S. Cornell 1954. Land and labor utilization in selected areas of the Philippines. *Purdue*.
- ROBERT H. REED, B.S. California 1949; M.S. 1953. Economic efficiency in multiple products freezing plants. *California (Berkeley)*.
- ALLEN B. RICHARDS, B.S.B.A. Northwestern 1951; M.S. Montana State 1955. Some effects of the federal grain programs on country elevators in Iowa. *Iowa (Ames)*.
- ROBERT B. SCHWART, B.S. Ohio State 1947; M.S. 1949. The relation of variations in education to the decision making of farmers. *Ohio State*.

- EMILY A. SHIEDLER, B.S. California 1954; M.S. 1955. Application of programming methods in forest management decisions. *California (Berkeley)*.
- RICHARD L. SIMMONS, B.S. Kansas State 1951; M.S. 1955. Optimum future adjustments in the milk processing industry. *California (Berkeley)*.
- VIDYAPATI SINGH, B.Com. Calcutta 1947; M.A. 1950. Financing of road improvements for farm marketing. *Western Reserve*.
- FRANCIS J. SMITH, JR., B.S. California Polytechnic 1948; M.S. Purdue 1952. The impact of technological changes on marketing of Salinas lettuce. *California (Berkeley)*.
- NORBERT J. STEFANIAK, B.B.A. Wisconsin 1948; M.B.A. 1950. Locational characteristics of Milwaukee industrial plants and their relation to the land use patterns. *Wisconsin*.
- JOHN R. TEDFORD, B.S. Connecticut 1950; M.S. 1951. Long-run and short-run elasticities of demand for farm products. *Iowa (Ames)*.
- JOSEPH VON AH, B.S. Swiss Federal Inst. Technology 1954; M.A. Nebraska 1957. The impact of industrialization and urbanization upon rural Wisconsin. *Wisconsin*.
- LUTHER T. WALLACE, B.A. Harvard 1949; M.S. Oregon State 1955. Factors affecting industrial location in Southern Indiana. *Purdue*.

### Labor Economics

#### Degrees Conferred

- ROGER L. BOWLBY, Ph.D. Texas 1958. The statutory regulation of minimum wages in Great Britain.
- ROBERT L. BUNTING, Ph.D. Chicago 1958. Employer concentration in local labor markets.
- GWENDOLYN J. BYMERS, Ph.D. California (Los Angeles) 1958. A study of employment in women's and misses' outerwear manufacturing Los Angeles metropolitan area, 1946-1954.
- JAMES F. CRAWFORD, Ph.D. Wisconsin 1957. Wage pattern following in the meat packing industry.
- STANLEY K. CROOK, Ph.D. California (Berkeley) 1958. The right to work: an historical review.
- JOSEPH R. DEMPSEY, S.J. Ph.D. Wisconsin 1958. The operation of the right-to-work laws.
- BERNARD FEDER, Ph.D. New York 1957. The collective bargaining and the legislative policies of the United Mine Workers of America, 1933-1947.
- SHELDON HABER, Ph.D. Johns Hopkins 1958. Trends in the share of females in the labor force.
- W. LEE HANSEN, Ph.D. Johns Hopkins 1958. Life cycle earnings patterns and intra-occupational differences in earnings.
- GEORGE W. HARDBECK, Ph.D. Illinois 1958. Union-management health and welfare programs since 1945.
- JAMES L. LUNDY, Ph.D. Minnesota 1957. An analysis of work sampling in the study of management job activity.
- IVORY L. LYONS, Ph.D. Harvard 1958. Competition between union and non-union mills in the hosiery industry.
- STANLEY MILLER, Ph.D. Wisconsin 1957. The United Mine Workers of America: a study of how trade union policy relates to technological change.
- JAMES R. MORRIS, Ph.D. Chicago 1957. Job rotation: a case study.
- ERNEST J. MOSBAEK, Ph.D. Iowa (Ames) 1957. Fitting a static supply and demand function for labor.
- IFTIKHAR AHMAD MUKHTAR, Ph.D. Columbia 1958. Industrial labor conditions and legislation in Pakistan.
- PHILLIP J. NELSON, Ph.D. Columbia 1957. A study in the geographic mobility of labor.
- ROBERT S. POLKINGHORN, Ph.D. Chicago 1958. Regional wage differentials.

- QUENTIN D. PONDER, Ph.D. Columbia 1958. The supervisory practices of high and low rated foremen.
- ELTON RAYACK, Ph.D. Chicago 1957. The measurement of the effect of the Amalgamated Clothing Workers of America on the wages paid in the men's clothing industry.
- JACK W. SKEELS, Ph.D. Wisconsin 1957. The development of political stability within the Auto Workers Union.
- HARRY F. STARK, Ph.D. Rutgers 1958. Trade union administration: theory and practice. A case study of the Amalgamated Food and Allied Workers Union, Local 56, AFL-CIO.
- RAMNARIAN TARNEJA, Ph.D. Cornell 1957. Profit sharing and the problems of technological change—a case study of the workload change in a textile mill.
- LEO TROY, Ph.D. Columbia 1958. The course of independent unionism.
- JOHN VANDENBERG, Ph.D. Michigan 1958. Some economic aspects of guaranteed wages and supplemental unemployment benefit plans.
- RICHARD J. WARD, Ph.D. Michigan 1958. The role of Association of Catholic Trade Unionists in the American labor movement.
- ARNOLD R. WEBER, Ph.D. Mass. Inst. Technology 1958. The International Chemical Workers Union: a study in structural adjustment.
- HERBERT E. WEINER, Ph.D. Columbia 1957. British trade unionism and nationalization, 1868 to 1945; the evolution of the nationalization policies of the British Trades Union Congress.

#### *Theses in Preparation*

- WAYNE G. ANDERSON, B.A. Tulane 1944; M.A. Iowa 1948. A study of the Federal Mediation and Conciliation Service as an independent agency. *Iowa*.
- SALVATORE BELLA, B.S. Boston Univ. 1947; M.A. 1948. A pattern and structure of collective bargaining in the electrical manufacturing industry. *Cornell*.
- GENE S. BOOKER, B.S. Ball State 1952; M.A.T. Indiana 1955. Labor market experience of a sample of unemployment benefit exhaustees. *Indiana*.
- WILLIAM G. BOWEN, B.A. Denison 1955. Wage determination and the price level: a theoretical analysis. *Princeton*.
- JAMES D. BROWN, JR., B.A. Union 1955; M.A. Wisconsin 1957. Value-added productivity and interindustry wage shifts. *Wisconsin*.
- JOHN H. G. CRISPO, B.Com. Toronto 1956. Collective bargaining in public enterprises: a comparative study of Ontario Hydro and TVA. *Mass. Inst. Technology*.
- ELBERT T. EGGERS, B.S. Bowling Green 1948; M.S. Colorado 1949. Policies and practices of hiring and placing the physically handicapped in selected industrial firms in metropolitan Atlanta. *Indiana*.
- LEO A. ELISON, B.A. Wisconsin 1948; M.A. Columbia 1951. Productivity of labor in the coal industry of the USSR. *Columbia*.
- IBRAHIM EL-SHERBINI, B.S. Univ. of Ibrahim, Cairo 1932; M.S. Wisconsin 1955. Problems of staffing and professional development of faculty in technical institutes and community colleges. *Cornell*.
- FRED HARTENSTEIN, B.A. Pittsburgh 1946; M.A. 1948. Federal policy with reference to secondary boycotts. *Pittsburgh*.
- EMANUEL HILDES, M.A. New School for Social Research 1953. Purpose, structure, and organization of the Association of Catholic Trade Unionists. *New School for Social Research*.
- JOHN D. HOLMES, B.A. West Virginia State 1950. Unions and technological change. *Illinois*.
- PAUL F. HUDDLESTON, B.A. Indiana 1942; M.B.A. 1949. The influence of military government on the development of German trade unions. *Alabama*.
- ETHEL B. JONES, B.A. Vassar 1952; M.A. Chicago 1954. Hours of work and the demand for leisure: 1900 to 1957. *Chicago*.

- ROBERT R. KESELL, B.A. Indiana 1953. Role of the international union representative in industrial relations. *Mass. Inst. Technology*.
- JOHN J. KORBEL, B.S., Harvard 1939; M.B.A. 1941; M.A. 1955. Determinants of labor force participation. *Harvard*.
- ARANKA KOVACS, B.A. McMaster 1955; M.A. Toronto 1956. The evolution of wage theories in relation to British economic development in the 19th century. *Bryn Mawr*.
- WILLIAM J. LEE, S.S., B.A. St. Mary's Seminary 1943; M.A. Catholic 1947. Right-to-work laws—economic and ethical aspects. *Catholic*.
- HAZEL MCCALLEY, B.A. Pennsylvania 1943; M.A. 1944. Collective bargaining problems of professional and technical employees in non-profit institutions. *Pennsylvania*.
- HARRY A. MCGUFF, B.S. Indiana Central 1952; M.B.A. Indiana 1954. Factors influencing success of graduates of liberal arts colleges who are employed in business. *Indiana*.
- HIKMAT NABULSI, M.A. Missouri. The labor movement in Syria. *Georgetown*.
- BARBARA W. NEWELL, B.A. Vassar 1951; M.A. Wisconsin 1954. A history of the Chicago labor movement in the nineteen-thirties. *Wisconsin*.
- LIGUORI A. O'CONNELL, B.A. Notre Dame 1949; M.S. Loyola 1953. Migratory labor in the State of Wisconsin. *Wisconsin*.
- J. ROY OTT, JR., B.S. Hendrix 1947; M.A. Vanderbilt 1950. Employment trends in the textile industry, 1947-1956. *Vanderbilt*.
- THOMAS J. REYNOLDS, B.A. Swarthmore 1933; M.A. Columbia 1935. Growth and structural change of manufacturing employment in New Jersey. *Columbia*.
- HENRY N. SANBORN, B.A. George Washington 1949; M.A. Chicago 1951. Earnings differences between men and women. *Chicago*.
- CHARLES P. SAWAYA, B.A. Michigan State 1955; M.A. 1956. The employment effect of minimum wage regulation: the case of southern pine. *Indiana*.
- JOSEPH SCHUSTER. Union management cooperation in job-skill training programs in the contract construction industry in the United States, 1932-57. *Georgetown*.
- KENNETH T. STRAND, B.A. Washington 1953; M.S. Wisconsin 1956. Jurisdictional disputes in the construction industry. *Wisconsin*.
- JOSEPH STRING, JR., B.A. California (Santa Barbara) 1950; M.A. California (Los Angeles) 1953. An analysis of the shortage of mathematics teachers in the public school system. *California (Los Angeles)*.
- S. HERBERT UNTERBERGER, B.S. Pennsylvania 1934; M.A. 1935. An assessment of wage incentive progress. *Pennsylvania*.
- RHEA H. WEST, JR., B.S. Tennessee 1947. Jurisdictional labor disputes in the atomic energy industry; a case study of the Oak Ridge operations. *Alabama*.
- RUDOLPH A. WHITE, B.S. Alabama 1951; M.S. 1953. A comparative analysis of manpower mobilization in England and the United States during World War II. *Alabama*.
- J. EARL WILLIAMS, B.A. Carson-Newman 1949; M.A. Tennessee 1950. Labor relations in the telephone industry. *Wisconsin*.
- ROBERT T. WOODWORTH, B.S. Indiana 1952; M.B.A. Northwestern 1955. Use of a survey method to determine the needs and problems of foremen in handling worker's complaints and grievances. *Northwestern*.
- MURRAY YANOWITCH, B.S.S. City (New York) 1947; M.A. Columbia 1949. Studies in Soviet wage structure. *Columbia*.

### Population; Welfare Programs; Standards of Living Degrees Conferred

- ROBERT S. DAVID, Ph.D. George Washington 1958. Social insurance in an expanding economy, 1935-1980.
- PAUL T. KINNEY, Ph.D. Southern California 1957. Financing medical care: a critical

analysis of the insurance and prepayment methods of financing medical care with particular reference to California.

SISTER CATHERINE THERESE KNOOF, Ph.D. California (Berkeley) 1957. Trends in the financial aspects of old-age and survivors insurance.

ALICE M. RIVLIN, Ph.D. Radcliffe 1958. An economic model for population projection.

LYELL J. THOMAS, Ph.D. Virginia 1958. Fiscal aspects of social security.

### *Theses in Preparation*

JACK MINKOFF, B.A. Cornell 1948; M.A. Columbia 1950. The social insurance system of the Soviet Union. *Columbia*.

ROBERT L. RANDOLPH, B.A. DePauw 1948; M.A. Illinois 1954. Some economic and financial implications of the 1950-1958 amendments to the Federal Old Age or Survivor Insurance Program. *Illinois*.

ROBERT L. ROBERTSON, JR., B.S. Cornell 1953; M.S. Wisconsin 1956. Public medical care in Wisconsin. *Wisconsin*.

WARREN G. ROBINSON, B.A. George Washington 1953; M.A. 1954; M.A. Princeton 1957. Rural-urban fertility differentials with special reference to some lesser developed areas. *Princeton*.

JACK R. WENTWORTH, B.S. Indiana 1950; M.B.A. 1954. Patterns of consumer income spending and saving, 1960-1970. *Indiana*.

## VACANCIES AND APPLICATIONS

The Association is glad to render service to applicants who wish to make known their availability for positions in the field of economics and to administrative officers of colleges and universities and to others who are seeking to fill vacancies.

The officers of the Association take no responsibility for making a selection among the applicants or following up the results. The Secretary's Office will merely afford a central point for clearing inquiries; and the Review will publish in this section brief description of vacancies announced and of applications submitted (with necessary editorial changes). Since the Association has no other way of knowing whether or not this section is performing a real service, the Secretary would appreciate receiving notification of appointments made as a result of these announcements. It is optional with those submitting such announcements to publish name and address or to use a key number. Deadlines for the four issues of the *Review* are February 1, May 1, August 1, and November 1.

Communications should be addressed to: The Secretary, American Economic Association, Northwestern University, Evanston, Illinois.

### *Vacancies*

**Economics:** Ph.D. with a background in forecasting, general economic activity trends, gross national product. Especially desirable would be experience as economist for an airline.

**Cost analyst:** At least 4 years of experience with broad-brush cost analysis, such as preparation of cost inputs for weapons systems studies.

**Cost analyst:** Several years of experience with computer costs, with emphasis on nonmoney costs and frame time analysis. Experience with real time is desirable. Salaries commensurate with educational background and experience. These three positions are with a nonprofit research organization and carry outstanding fringe benefits. Please send detailed résumé to: Robert W. Frost, System Development Corporation, 2400 Colorado Avenue, Santa Monica, California.

**New South Wales University of Technology:** The University invites applications for appointment to the positions of Senior Lecturers/Lecturers, School of Economics, Sydney. Salary: Senior Lecturers—£2211 range £2561 per annum ( $5 \times £80 + 1 \times £30$ ); Lecturers—£1511 range £2111 per annum ( $7 \times £90 + 1 \times £60$ ). Commencing salary according to qualifications and experience. Candidates should possess an honours degree in economics or economic statistics or equivalent qualifications. Preference will be given to candidates specializing in the fields of: theory of the firm, the economics of growth and development, econometrics and economic statistics, applied economics.

The University meets cost of first-class sea passages for successful appointee and family and is prepared to contribute for approved removal expenses up to a maximum of £Stg. 150. The successful appointee will be eligible, subject to a satisfactory medical examination, to contribute to the State Superannuation Fund providing for a pension of approximately half salary on retirement.

For further details, candidates should write to Professor D. C. Rowan, School of Economics, New South Wales University of Technology, Kensington. Applications should be forwarded in an envelope marked "University Appointment" to the Bursar, Box 1, Post Office, Kensington, New South Wales, Australia.

